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U. S. DEPARTMENT OF AGRICULTURE
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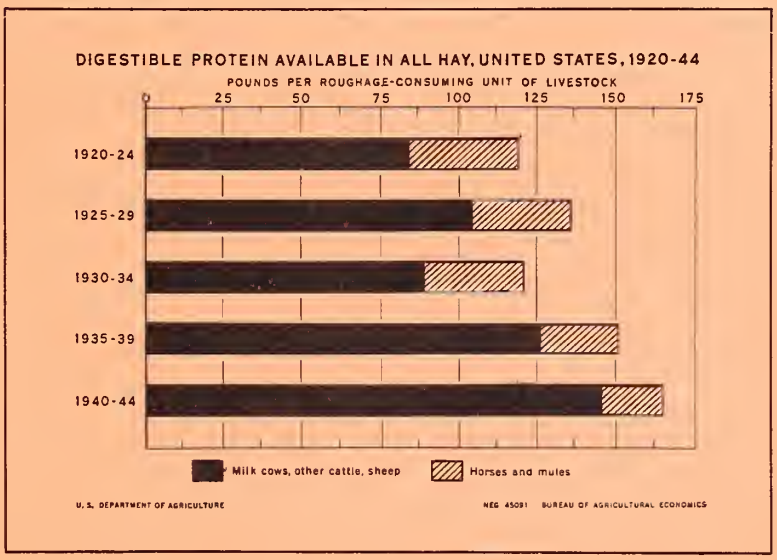
Changes IN HAY PRODUCTION IN WAR AND PEACE



by Neil W. Johnson

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Source of Data

This study is based largely on the acreage, yield, and production of hay crops as reported for each State and published annually by the Bureau of Agricultural Economics. Data are obtained originally from large numbers of volunteer crop reporters in all parts of the country. As relatively few stands of hay are confined to a single kind without dilution by other types or by weeds, only approximate general trends, rather than closely defined changes, can be determined.

Classification is made on the basis of predominant hay type and local terminology. In some areas original seedings are mixed hays combining both legumes and grasses. It is impossible, for example, to separate the acreage reported as clover and timothy hay into its component parts, yet it is known that the proportion of clover in clover and timothy hay is now much higher than was true 20 years ago when more timothy was raised for horse feed. Yields reported on a State-wide basis are always lower than those being obtained by good farmers in the best areas. As the same methods of reporting have been used through the years, any trends exhibited should be on a comparable basis.

Acknowledgments

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CHANGES IN HAY PRODUCTION IN WAR AND PEACE

By Neil W. Johnson, Agricultural Economist

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Pre-War and Wartime Changes

The harvested acreage of all tame hay has increased during the last 30 years from a 50-million (1910-14) to a 60-million acre level (1940-44). Of the 10-million-acre increase, about 8 million took place in the decade 1915-24, with the opening of new dry farming land in the Plains and new irrigated land in the West. In the following 15 years (1925-39), there was a moderate recession, the level fluctuating around 55 million acres (see fig. 1). Recovery after the severe droughts of the middle thirties permitted reaching a 60-million acre level by 1940. We have managed to maintain this level nationally during the war years.

Although the acreage of all tame hay harvested in the United States as a whole can thus be said to have undergone only moderate changes, there have been very significant changes in different parts of the country, both in the kinds of tame hays produced and in their quantity and quality. We have now reached our highest level in tame hay production, but there are areas where food crops for direct human consumption have displaced acreages that were formerly devoted to hay. Furthermore, a significant portion of the total wartime increase in tame-hay production is a byproduct of expanding the acreage of peanuts in the South. The average pre-war harvested acreage of peanut-vine hay (1,759,000 acres in 1937-41) had more than doubled by 1943 and is being maintained near that level.

Twenty years ago nearly 60 percent of our tame hay acreage was reported as "clover and timothy" hay. This included stands of timothy, of clovers, and of mixtures of the two. For our purposes, it is unfortunate that it is impossible to separate the grass and the legume hays in this group. (See statement under "Source of Data" on opposite page and the opening paragraph of the detailed discussion of clover and timothy hay on page 6, for an elaboration of this point.) The hays reported in this classification, however, now represent but a third of the tame-hay acreage; and the displacement of timothy through the years by the higher yielding, more nutritious,

HAY, HARVESTED ACREAGE: ALL TAME HAY AND SUBCLASSES, 1924-44

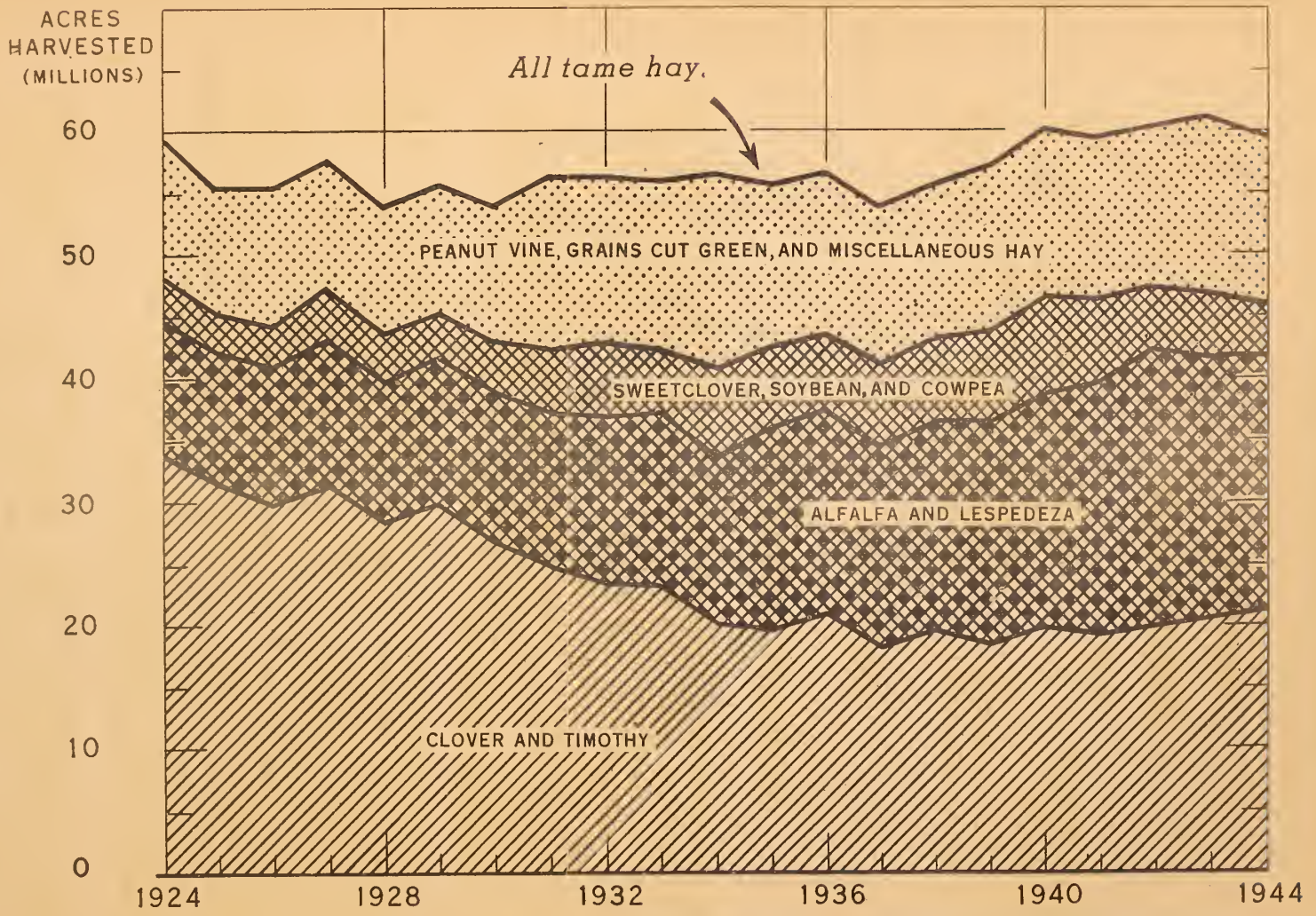

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Figure 1.- The upward trend since 1937 in harvested acreage of all tame hay for the United States has not been appreciably slowed in wartime. Some tame hay has been displaced in areas where direct food crops could be grown, but this has been offset nationally by increases in others, chief of which is that caused by wartime expansion of peanut acreage in the South. The displacement through the years of the timothy in the acreage reported as "clover and timothy" by higher yielding, more nutritious legume hays, is of great significance.

legume hays such as alfalfa, and red clover and the increase of lespedeza has been of great influence in improving the Nation's supply of high-quality forage. The acreage devoted to the principal legume hays that are reported separately (alfalfa, lespedeza, sweetclover, soybean, and cowpea hay) is shown in figure 1 as constituting a steadily increasing proportion of the total acreage in tame hay. In addition, there is the large red clover acreage on which statistics are not reported separately. This probably constitutes more than a third of the acreage reported as "clover and timothy" in recent years, making red clover second only to alfalfa in importance as a legume hay.

Comparisons on a production basis are even more significant. Small quantities of legume hay are included in the reported production of miscellaneous tame hay. The acreages reported as "clover and timothy" likewise include legumes, and hay reported as alfalfa or other legumes is frequently cut from mixed stands. Recognizing these limitations of the statistics, about a fourth of the total hay production was composed of the leguminous hays that are reported separately during the 1920-24 period, as contrasted with nearly a half in 1940-44 (table 1). This increase is contrasted with a decrease in production of the class listed as "clover and timothy" hay of almost the same proportions -- a fact discussed later in this report.

Table 1.- Average production of all hay and relative importance of different kinds by 5-year periods, United States, 1920-44

5-year average	All hay	Percent of all hay			
		Tame hay			Wild hay
		Legumes reported separately 1/	Clover and timothy	All other tame hay 2/	
	1,000 tons	Percent	Percent	Percent	Percent
1920-1924	90,503	25	46	13	16
1925-1929	85,077	33	42	11	14
1930-1934	73,801	40	33	15	12
1935-1939	84,247	46	28	14	12
1940-1944	96,430	3/ 48	3/ 28	13	11

1/ Alfalfa, lespedeza, sweetclover, soybean, peanut-vine, and cowpea hay. Exlusive of the clovers reported in "clover and timothy" hay.
2/ Grains cut green for hay and production reported as miscellaneous tame hay.
3/ The legume percentage would be increasingly greater in recent years and the "clover and timothy" percentage considerably smaller if statistics on clover hays (grown alone) were available and included.

What is the significance of this shift to the legume hays? Part of the answer is found in increased total production of tame hay. Alfalfa among the legumes shows marked superiority over nonlegume hays in yield (appendix table 2). This is also true of first-year yields on red clover which are equal to those of alfalfa in many areas.

Table 1 shows that the volume of all-hay production in the period 1920-24 was second only to that of 1940-44. A considerable volume of hay was needed in this earlier period for numbers of roughage-consuming livestock on farms were still close to the all-time peak attained in 1918 -- nearly 92 million units. At this time, however, about 29 percent of the roughage-consuming livestock were horses and mules as contrasted with but 16 percent in 1940-44.

This shift in the composition of roughage-consuming livestock is of sufficient importance to warrant repeating the figures here.

Table 2.- Estimated number of hay-forage and pasture-consuming animals on farms by 5-year periods, United States, January 1, 1920-44 1/

5-year average	Horses and mules	Milk cows, other cattle and sheep	Total
	Million A.U.	Million A.U.	Million A.U.
1920-1924	24.5	61.3	85.8
1925-1929	21.2	55.5	76.7
1930-1934	17.9	62.8	80.7
1935-1939	15.8	62.5	78.3
1940-1944	13.7	69.5	83.2

1/ Numbers converted to animal units as follows: Horses and mules, 1.00; milk cows, 1.00; other cattle, 0.75; sheep, 0.12.

Despite this shift between classes of roughage-consuming livestock, total numbers are higher than at any time since the 1920-24 period. Even so, the quantity of hay available per unit (after deducting that fed to horses and mules) has increased 540 pounds, or 36 percent, since 1920-24 (table 3). Some of the increase during the period 1940-44 may be due to weather more generally favorable to hay production than is usually anticipated. Much of the increase, however, is likely to be maintained. Hay supplies, of course, are not evenly distributed over the entire country. Only in emergencies does it move long distances. In any given locality, therefore, both the quantity and quality of available hay may differ from the averages discussed.

Table 3.- Changes in quantity and protein content of all hay available per unit of roughage-consuming livestock, United States, 1920-44

5-year average	All hay produced	Hay per unit of livestock		Digestible protein in all hay	Digestible protein per unit of livestock	
		Milk cows, other cattle, and sheep 1/	All roughage-consuming livestock		Milk cows, other cattle, and sheep 2/	All roughage-consuming livestock
	1,000 tons	Pounds	Pounds	1,000 tons	Pounds	Pounds
1920-1924	90,503	1,520	2,100	55,118	84	119
1925-1929	85,077	1,700	2,220	5,255	104	137
1930-1934	73,801	1,320	1,820	4,944	88	122
1935-1939	84,247	1,780	2,160	5,925	126	151
1940-1944	96,430	2,060	2,320	6,853	146	165

1/ After deducting 1.8 tons of average hay per head for horses and mules.
2/ After deducting estimated digestible protein in hay fed to horses and mules.

Not only is more hay available, but it has a higher protein content -- a fact of real importance. Milk cows, other cattle, and sheep require much more protein than do horses and mules, whose energy is transformed into farm power rather than into milk, meat, or wool -- products that contain much protein. For example, the average protein requirements for a mature 1,000-pound horse at medium work are about 70 percent of those for a mature dairy cow of the same weight that produces 20 pounds of milk per day. A 1,000-pound fattening steer takes even more than the cow. Growing animals need much more protein than mature livestock. The proportion of young stock is much higher for cattle and sheep than for horses and mules, which have failed to maintain their numbers while other types of roughage-consuming livestock have maintained their numbers through the years and have supplied large numbers of young animals for meat.

The principal legume hays carry only slightly more total digestible nutrients than do grass or grain hays, but their digestible protein content ranges from about 8 to 12 percent as compared with about 2 to 6 percent for hay made from the common grasses and grains. (See appendix, table 15.) During the last 25 years, the pounds of protein available in hay per unit of roughage-consuming livestock (exclusive of that fed to horses and mules) have increased 74 percent; from 84 to 146 pounds (table 3). An increase of 16 percent has even been registered since 1935-39.

These increases, both in quantity of available hay and in its protein content, directly influence our total agricultural output. As we needed all of the hay produced during 1940-44 and as its high protein content still falls short of quantities nutritionally desirable, we can ask the question, how many acres were saved because of increases in yield per acre and in protein content of hay for production of crops urgently needed in

wartime? The average yield of all hay (including wild hay) during 1925-29 and 1935-39 was 1.22 and 1.24 tons, as contrasted with 1.32 tons per acre during the last 5 years. If the 1925-29 yield level of 1.22 tons per acre had prevailed in 1940-44, about 6.1 million additional acres of hay would have been required to obtain the 1940-44 production of more than 96 million tons. Even with the 1935-39 level of yields 4.8 million extra acres would have been necessary.

Of greater significance are similar comparisons with respect to changes in nutrient content. The average quantity of hay available annually during 1940-44 contained about 1.6 million more tons of digestible protein than that of the 1925-29 period. About 16 percent of this was due to changes in acreage, 28 percent to increases in yield, and 56 percent to shifts to leguminous hays of higher protein content than grass hays. In 1925-29, a ton of average hay contained about 124 pounds of digestible protein as contrasted with 134 pounds, 141 pounds, and 142 pounds in succeeding 5-year periods. If the composition of our hays had not changed since 1925-29, we would have needed 17.7 million additional acres to provide the same quantity of digestible protein as was available in our 1940-44 hay supply. Even with hay of 1935-39 nutrient content, an additional 5.6 million acres would have been necessary. The shift, then, to higher yielding and higher protein hay crops through the years has contributed very decidedly to our wartime food output by making the acres thus saved available for higher priority war crops and by providing more protein for our livestock.

These comparisons are necessarily rough. Perhaps the main source of error is in assuming a constant quantity of digestible protein in the hay reported as clover and timothy through the years. Adjustments probably would increase still further the quantity of protein available to our productive roughage-consuming livestock, tending only to reinforce the conclusions already drawn.

Clover and Timothy Hay

The acreage reported as clover and timothy hay contains red, alsike, and Ladino clover, timothy, and small quantities of other hays. Because of the extreme variability in farm practices in seeding these crops alone and in mixtures, and in local terminology in reporting, it is impossible to present a clear statistical picture of each of the component parts. In earlier years, however, timothy hay constituted a high proportion of the acreage reported as clover and timothy. Timothy has long been considered superior hay for the feeding of horses, but the decrease in numbers of horses and mules has been so great that, since 1920, some 60 million acres of crop and pasture land have been released from producing feed for them. About 15.5 million of these acres were producing hay.

By estimating the domestic disappearance of the seed of red, alsike, and Ladino clover, and timothy, and converting this into acres, it is possible to get some indication of the relative importance of these hays in the combined harvested acreage of clover and timothy hay as currently reported (table 4). In recent years, red clover has tended to catch up and then to

Table 4.- Estimated domestic disappearance of red, alsike and ladino clover seed and timothy seed, and acreage equivalent at common seeding rates 1935-44 (cleaned seed basis)

Year	Domestic disappearance				Estimated acreage 1/			
	Red clover	Alsike clover	Ladino clover	Timothy	Red clover	Alsike clover	Ladino clover	Timothy
	(000 Lbs.)	(000 Lbs.)	(000 Lbs.)	(000 Lbs.)	(000 Acres)	(000 Acres)	(000 Acres)	(000 Acres)
Av. 1935-39	52,124	15,817	---	75,470	5,212	3,954	---	9,434
1935	38,113	11,853	---	82,148	3,811	2,963	---	10,268
1936	50,597	16,171	---	77,063	5,060	4,043	---	9,633
1937	33,728	19,140	---	91,439	3,373	4,785	---	11,430
1938	73,181	17,870	---	70,601	7,318	4,468	---	8,825
1939	65,000	14,050	---	56,097	6,500	3,513	---	7,012
1940	95,319	15,291	---	52,276	9,532	3,823	---	6,535
1941	65,331	13,748	---	44,640	6,533	3,437	---	5,580
1942	62,135	12,202	497	45,624	6,214	3,051	248	5,703
1943	70,400	12,565	425	54,747	7,040	3,141	212	6,843
1944	---	---	829	---	---	---	414	---

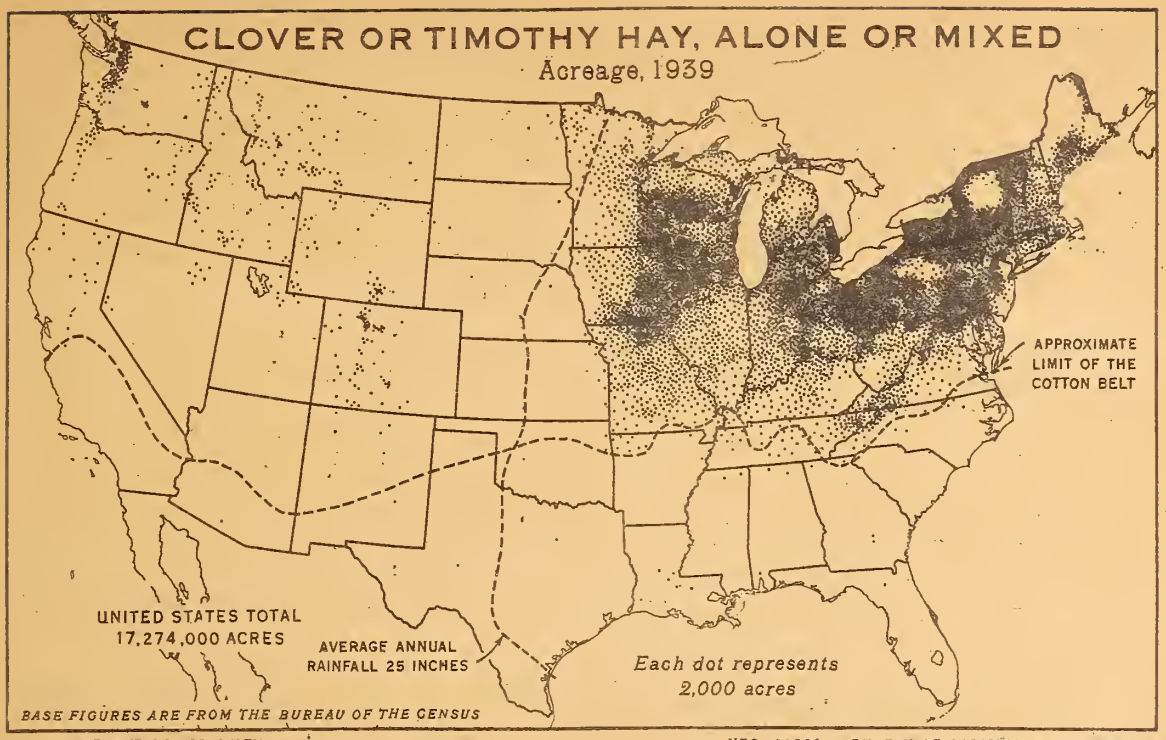
1/ Seeding rates used to convert pounds of cleaned seed to acres were:- red clover 10 pounds per acre, alsike clover 4 pounds, ladino clover 2 pounds, and timothy 8 pounds.

outstrip timothy in relative importance, and this shift would probably have been more pronounced if seed of adapted red clover had been available in the quantities wanted by farmers. The combined acreage equivalents of alsike and red clover as approximated in table 4 for the 1935-39 period were not quite so great as that for timothy hay. But since 1940, the legume portion of the harvested acreage of clover and timothy appears to be fully double that in timothy. Ladino clover, a relatively new crop, is expected to make an important contribution to supplies of hay and pasture in the dairy sections of the Northeastern States as more seed becomes available.

The upturn in size of harvested acreage of hay reported as timothy and clover during the last 5 years (fig. 1) reflects the increasing predominance of red clover and, as a consequence, a hay of higher quality and greater productivity than that of earlier years. The index of per acre yields of clover and timothy for the 1940-44 period is 112, using United States average yields of 1935-39 as 100. Only part of this increase can be attributed to favorable weather.

Although clover and timothy are grown to some extent in the intermountain and far western States, by far the largest portion of the acreage is found in the eastern half of the United States and north of the limit of the Cotton Belt (fig. 2). This localization of the crop is influenced primarily by conditions of soil, precipitation, and temperature, and the ability to compete favorably with other adapted hay crops. In some of these States it is difficult to obtain good stands of alfalfa or of clover planted alone, and diseases such as alfalfa wilt take their toll. Under these circumstances, stands of mixed hay give the most satisfactory results. In Ohio, for instance, a mixture of 4 to 5 pounds of alfalfa, 4 to 5 pounds of red clover, 1 pound of alsike clover, and 3 to 4 pounds of a suitable grass is being currently recommended.

The principal clover and timothy hay-producing States have been separated into two groups for study in the lower half of figure 2. In New England and the adjacent States, clover and timothy continue to stand as by far the largest contributors to the total hay supply. Some decline in importance is indicated, since they currently account for about 68 percent of all-tame hay production as compared to 80 percent or more 20 years earlier. In the western portion of the clover and timothy belt the displacement is more pronounced, these hays now contributing but little more than 40 percent of the tame hay production as contrasted with 80 percent or more in the early twenties. Rapid increases in the acreage of alfalfa in the more northern and lespedeza in the more southern States of this group are responsible for most of this change. An index of harvested acreage of clover and timothy provides striking evidence of the different rates of displacement in these areas and shows that the trend toward recovery in acreage is evident mainly in the western area where the decline in timothy is more than offset by increases in the acreage of red clover.



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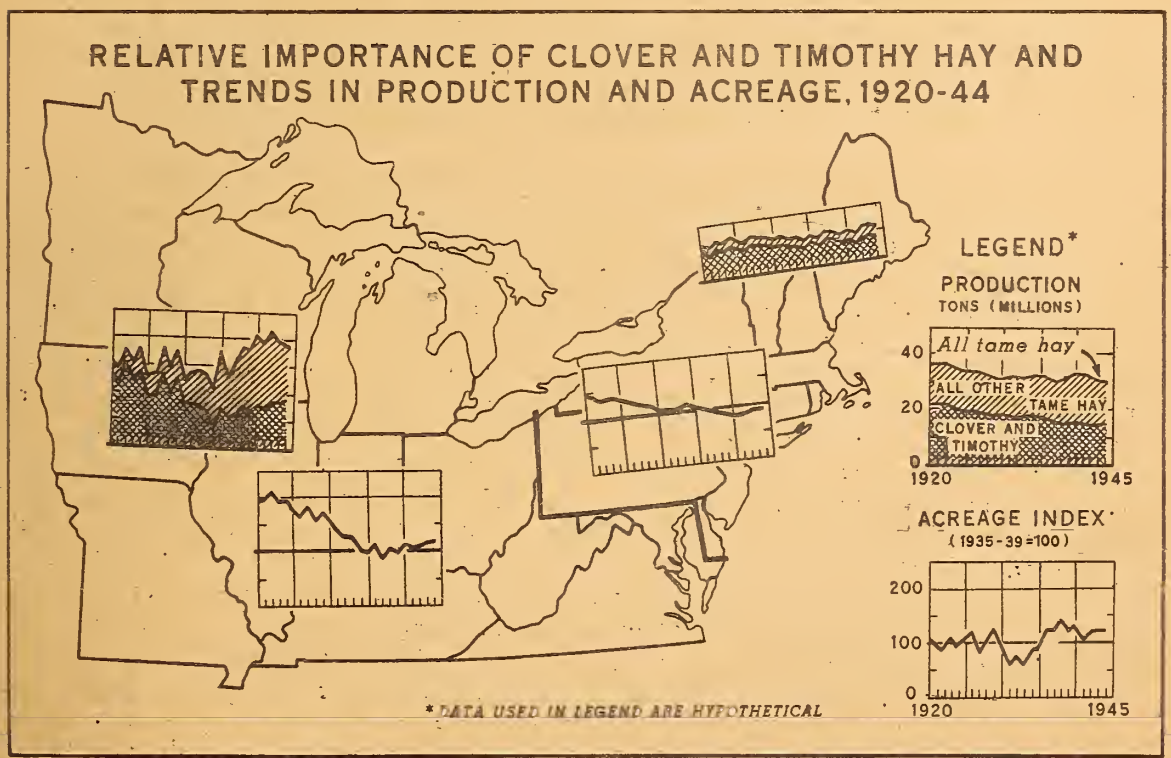

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Figure 2.- Clover and timothy hay still predominate in the Northeastern States, although the long-time acreage trend is moderately downward. Tame-hay production in the Corn Belt and Lake States has increased decidedly, with the timothy in the acreage reported as "clover and timothy" decreasing rapidly in relative importance. The recent upward trend of all hay in the Corn Belt and Lake States is explained by an increasing tendency to plant mixtures composed of legumes and grasses, the resulting hay being more productive and of higher quality than that cut from acreages reported as "clover and timothy" in earlier years.

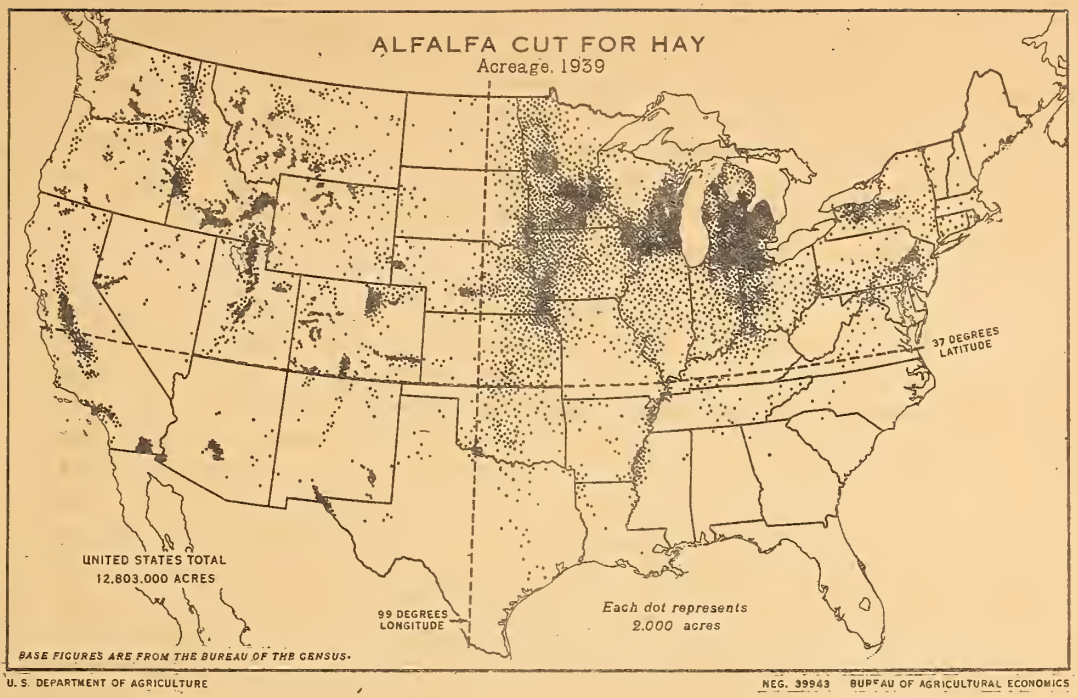
Alfalfa Hay

Alfalfa is the most widely distributed of our hay crops. It is an important contributor to the forage supply in all but the Southeastern States (fig. 3). It is least adapted to humid conditions and to wet heavy soils that are lacking in lime. An attempt was made to grow alfalfa in Georgia as early as 1736, but its rapid expansion in this country dates from 1850 when it was introduced into California from Chile.

The important areas in the West that have been reclaimed by irrigation are located where annual precipitation is very low and only a little reserve of organic matter is accumulated in the virgin soil. Under these conditions, the first crop grown is usually alfalfa, which also has an important place in the rotation on most irrigated farms. It is also grown under dry-farming conditions in western areas where annual precipitation is somewhat greater. In the Northern Plains States, a considerable acreage of dry-land alfalfa is grown not only for hay but for seed, the hardy varieties produced there being less subject to winter kill than seed produced farther south.

Alfalfa spread rapidly on the farms of the Western States, and its use in farming systems is by now well stabilized there. For more than two decades, around two-thirds of the tame hay produced in this region on both sides of the Continental Divide has been alfalfa hay (fig. 3). A moderate upward trend in production of all tame hay and alfalfa hay is indicated for States of the western slope, whereas those of the eastern slope and plains strikingly reflect the serious droughts of the thirties.

Most of the story of the expansion of alfalfa in the Midwest and the Northeast is shown in figure 3. Nearly all this expansion has occurred since 1920, and the bulk of it during the past 10 years. In the Lake States, for instance, alfalfa hay contributed but 1 percent of the total tame hay supply in the years 1920-25, compared with 45 percent during the last 5 years, 1940-44. Indeed, the three leading States in alfalfa acreage during the period 1933-42 were Minnesota, Michigan, and Wisconsin. Each harvested well over a million acres. During 1944 Wisconsin has been displaced by California as the third State in harvested acreage. Because of its longer growing season, however, California obtained twice the tonnage of any other State in 1944. Alfalfa wilt appears to be responsible for current decreases in alfalfa acreage in Wisconsin, but the production of resistant varieties now under way may serve to overcome this difficulty. The rapid expansion in the Lake States may be attributed to the growing realization that alfalfa presents an opportunity for substitution of a better quality, more productive legume; to the encouragement given by Government programs in liming the soil and in the seeding of legumes, both for hay and for conservation; and to weather that has been especially favorable for these enterprises in recent years. Over a series of years, alfalfa hay appears to yield at least a half-ton per acre more than timothy and clover hay in these States. A downward trend in production of both alfalfa and all tame hay is shown for the Lake States since 1942. Some of the acreage previously used for hay has been put to more intensive uses in growing urgently needed war crops for direct human consumption.



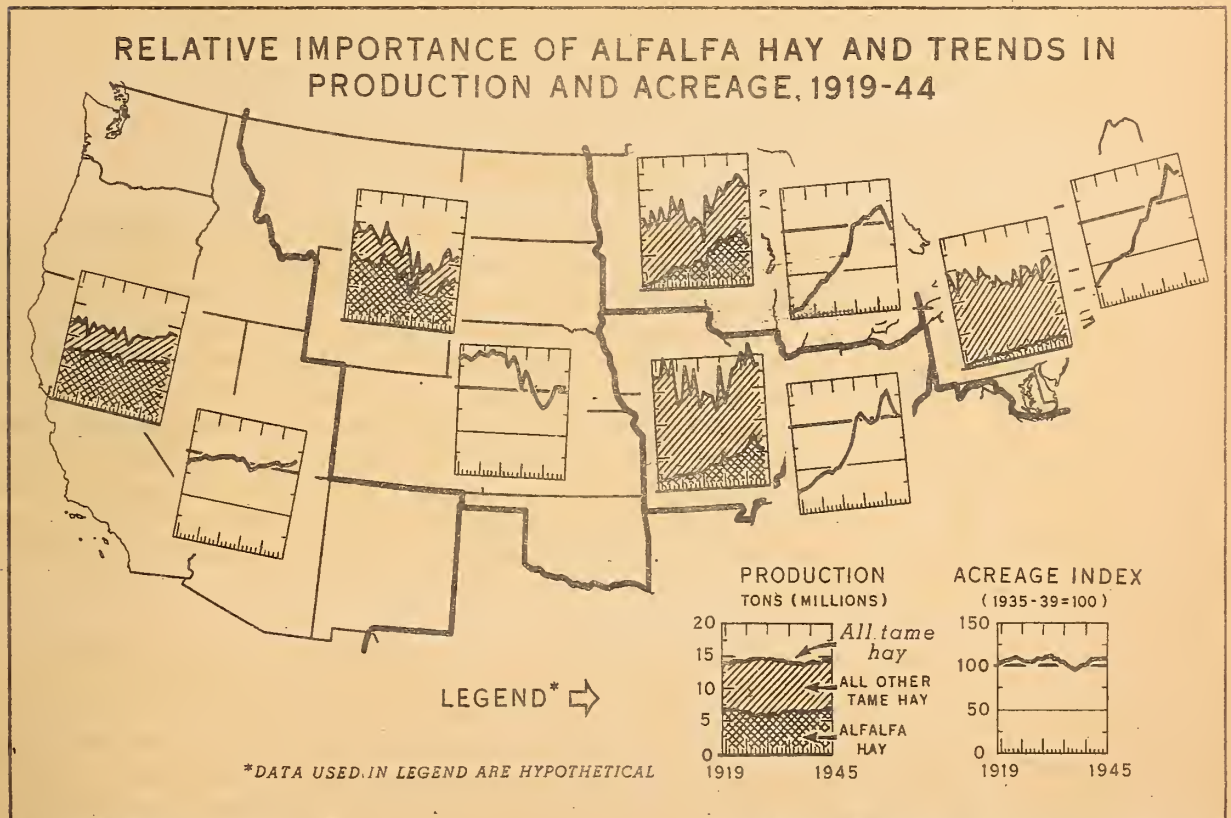


Figure 8.- Alfalfa is our most widely distributed and most important legume hay. Becoming of commercial importance first in the West, it is now stabilized as the main source of tame hay there, particularly under irrigation. Production of hardy strains of alfalfa seed has been an important source of income on dry farms in the Great Plains where the enterprise shows the serious effects of the droughts of 1934 and 1936. Displacement of other hays by alfalfa has been most pronounced in the Lake States and Corn Belt; but considerable decreases, in both production and acreage, have taken place during the war.

The trend in expansion of alfalfa acreage and production in the Corn Belt is similar to that for the Lake States (fig. 3), but alfalfa still represents less than a third of the Corn Belt's tame hay production as contrasted with nearly a half of that in the Lake States. Lack of adapted improved varieties has been a handicap for this section. Further expansion is probable, but it seems likely that hay mixtures containing different clovers, alfalfa, timothy, and other grasses will hold an important place, as will lespedeza and soybean hay.

Alfalfa production in the Northeastern States is increasing steadily, but alfalfa contributes only 14 percent of a tame hay supply which consists largely of clover and timothy. Here, as in other regions, there appears to be an advantage of at least a half ton per acre in average yield in favor of alfalfa. Against this yield advantage, however, must be placed the difficulty and the additional cost of obtaining good stands of alfalfa on soils that are lacking in lime, phosphates, and potash. Alfalfa does not do well on acid soils, those poorly drained or of low fertility. Frequent freezing and thawing of the soil during the winter brings "heaving", resulting in some winter killing of stands. Where summer rainfall is heavy, alfalfa is perhaps more difficult to cure than some of the grass hays. These factors, together with improvement in the quality of the hay from acreages reported as clover and timothy, are probably responsible for the relatively slow expansion of alfalfa in the Northeastern States, and particularly in New England. Here, as in other areas, the clovers are displacing timothy in the acreages reported as clover and timothy hay.

Lespedeza Hay

Common lespedeza was grown by southern farmers even before the Civil War, and its distribution in the South was widening by the turn of the century. The introduction in the early twenties of Korean lespedeza, an annual variety, and Sericea, a perennial, focused additional interest on the crop. Later improvements in both common and Korean varieties have extended the range of adaptation to the North and West. Since the early thirties, with an awakened consciousness of soil losses through erosion, the acreage has expanded rapidly for erosion control, for hay, and for pasture. The lespedezas fill the need for a better quality legume in areas where forage has been especially lacking. The following quotation from "The Annual Lespedezas as Forage and Soil Conserving Crops" of the U. S. Department of Agriculture Circular 536, is especially pertinent:

"It should be made clear that the lespedezas are not competitors of the clovers or of alfalfa. Their principal field of usefulness begins where that of the clovers leaves off -- at a certain ill-defined level of soil productivity or where, for reasons not connected with soil productivity, the clovers are not well-adapted. For example, on certain productive lands in Indiana and Illinois the clovers repeatedly failed to make a stand, whereas Korean lespedeza succeeded. It is probable that heavy growths of grain so weakened the clover that it perished from heat and drought after the grain harvest. Lespedeza was able to withstand these conditions. Again, where a one-year rotation of grain and legume is desirable, lespedeza is better adapted than clover and can serve a useful purpose even on soils otherwise suited to clover.

"By and large, however, lespedezas are suited to soils of a lower fertility level than clovers, and it is on such soils that they are paramount. In the region south of the Potomac, the Ohio, and the Missouri Rivers, and east of Kansas and Oklahoma, the acreage of low fertility land vastly exceeds that of high fertility. Parts of this region are badly eroded and are still eroding. There is need for a legume that will control this erosion, build up the land, and at the same time yield the farmer some income. The annual lespedezas fill this need. No other legume has a more important part over so wide a territory in checking erosion and in gradually improving worn land with the least outlay of cash. At the same time, lespedeza will pay its way in hay, pasturage, and seed."

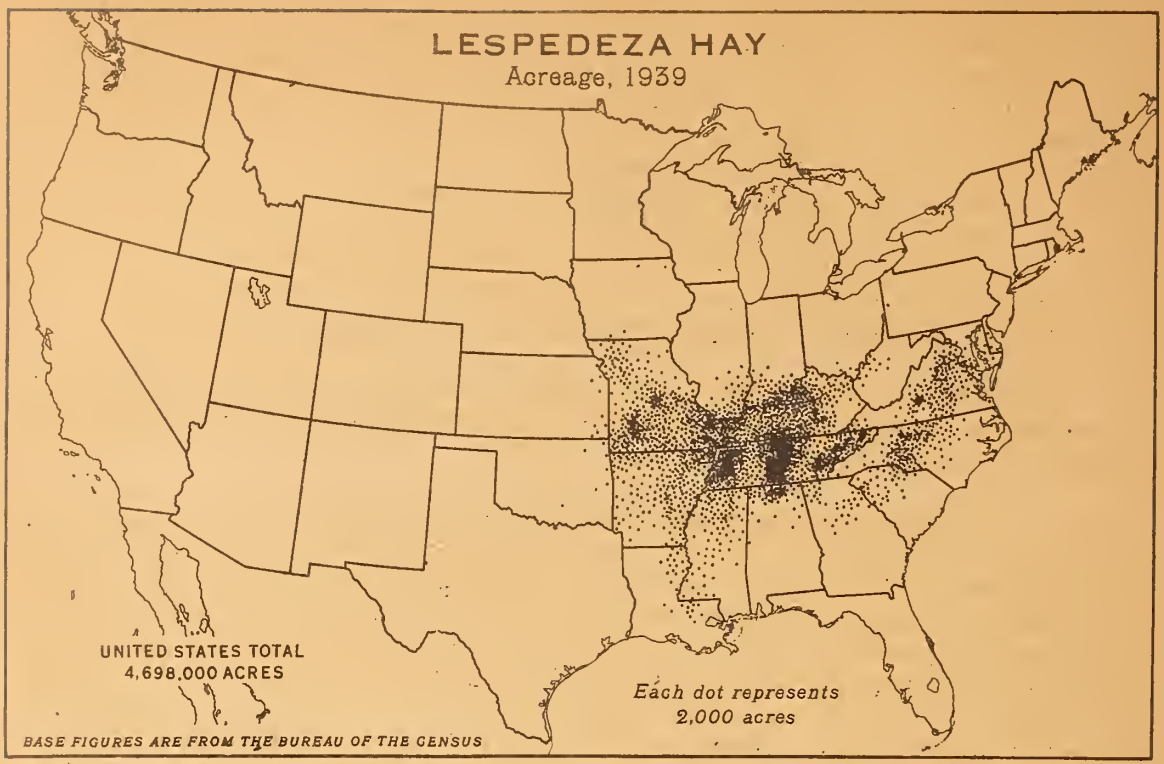
Lespedeza will grow under conditions that are adverse to other legume hays, but it will do relatively better on the better soils and where fertilizer is applied to soils of low fertility.

It is roughly estimated that nearly 40 million acres are now growing lespedeza. An accurate account is not available. Less than 7 million acres are being harvested for hay (fig. 4), an undetermined quantity is used only for pasture, and large acreages are used only for erosion control. Lespedeza Sericea, because of its perennial nature, holds promise in erosion control as more seed becomes available. When harvested early, the lespedezas make excellent hay and have about the same nutritive value as alfalfa. Figure 4 indicates the rapid climb of lespedeza into prominence as a hay crop in the South. In 1924-29 it contributed less than 4 percent of the total supply of tame hay for the indicated States as contrasted with about 36 percent during the last 5 years, 1940-44. Lespedeza is destined to play an increasingly important part as the South adjusts toward a more diversified farming economy with greater emphasis on livestock enterprises.

Cowpea Hay

The cowpea, like lespedeza, is a warm-weather legume that will grow on a wide variety of soils, including those that are shallow and those deficient in lime. It is a good soil-builder when used in rotation or plowed under as a green-manure crop, but it is not effective in erosion control since the land is left bare over winter after the annual crop is harvested. Where soil conservation is the main objective the annual lespedezas, on the other hand, are grown on the same land from year to year and they tend to reseed themselves, providing a more permanent cover.

Cowpea hay is not generally of major importance to the tame-hay supply in the South Central and Southeastern States. At no time in the last 20 years have they contributed as much as 3 percent of the production of all tame hay for the area as a whole. But the crop is especially important in certain parts of the Southern States. During the years 1932-41, 43 percent of the cowpea acreage in the United States was harvested for hay, 30 percent was grazed or plowed under, and 27 percent was harvested for peas. These proportions vary widely from State to State. From two-thirds to three-fourths of the acreage in Missouri, Tennessee, and Virginia is harvested for hay. About 60 percent of the acreage in Texas is grazed or plowed under, compared with only 35 to 45 percent for the Delta States of Arkansas, Mississippi, and



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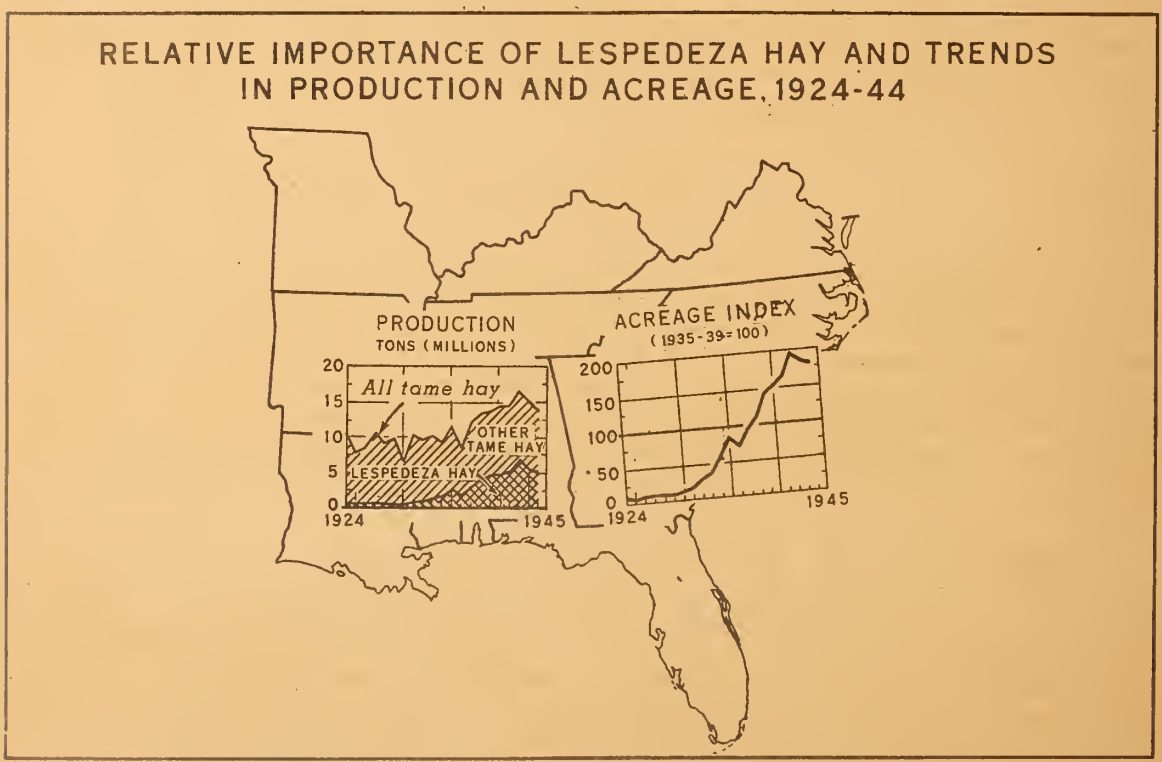

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Figure 4.- Lespedeza has attained prominence as a major source of good-quality leguminous hay in Southern States during the last decade. While responding well to applications of lime and fertilizer, it will make reasonably good growth on soils of low productivity. When the annual varieties are allowed to reseed or the perennial types are grown, the crop is a valuable aid in erosion control.

Louisiana. Alabama harvested 43 percent of its acreage for peas, followed by Georgia, Illinois, and Mississippi, which harvested around 33 percent. South Carolina, Texas, Georgia, and Arkansas, in the order named, devoted the largest acreages to cowpeas. Each of these States averaged more than half a million acres during 1932-41 -- and their combined acreage represented 53 percent of the national total.

While cowpea hay yields well and is highly nutritious, it is difficult to cure, and the labor requirements in producing a hay crop are nearly double those for lespedeza hay. Much of the seed is hand-harvested, expensive if purchased, and time-consuming if produced at home. These are, no doubt, factors which have influenced a general decline in cowpea acreage since 1941; and it seems likely that, where hay production is the major objective, cowpeas will continue to be displaced by soybeans and lespedeza.

Peanut-Vine Hay

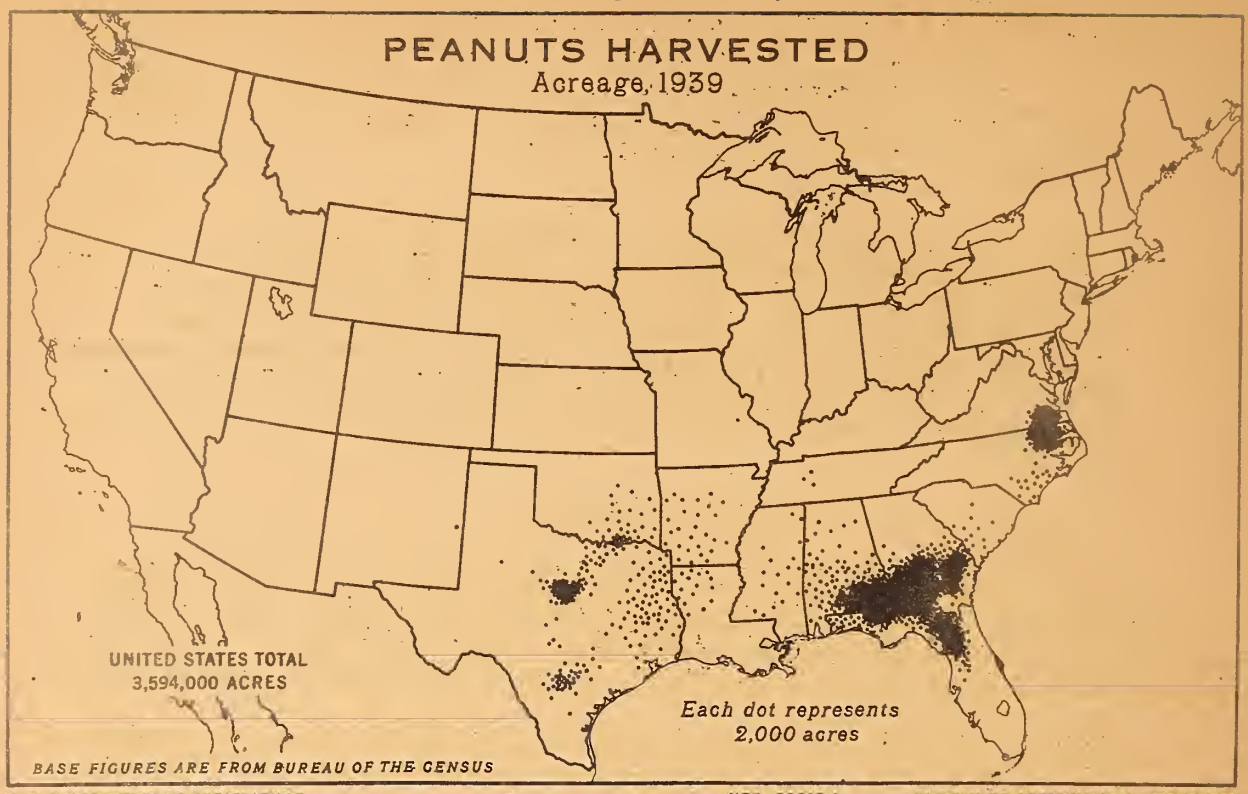
In the event of acute shortages of other hays or of weather conditions resulting in partial crop failure, a small part of the total peanut acreage may be harvested primarily for hay. On the bulk of the acreage, however, peanut-vine hay is a byproduct of the threshing of the peanut crop.

Since in the harvesting process the entire plant is removed from the ground, the resulting hay contains the roots as well as the top. Its value for feeding is influenced by its relative freedom from dust and dirt and on the method by which the crop has been handled. In the sub-humid areas where peanuts are cured in the windrow, many of the leaves of the plant are lost, greatly reducing the feeding value of the hay. Where rain is more frequent during the harvesting season, the vines are cured in stacks, and the hay is of generally better quality. With proper care, peanut-vine hay furnishes a desirable feed for dairy cows, horses, and mules. It contains less protein than alfalfa, clover, or cowpea hay; but more than in stover or grass hays.

Figure 5 shows the location of the peanut enterprise in 1939, indicates the relative importance of peanut-vine hay through the years, and illustrates the remarkable increases in acreage during wartime. In the Southeastern States (South Carolina, Georgia, Florida, Alabama, Mississippi) nearly half the peanut acreage was hogged off in the pre-war period, 1932-41, and the practice was increasing. The wartime need for the whole nuts has temporarily reversed this trend. The proportion hogged off has dropped from 39 percent in 1942 to 37 percent in 1944, with a consequent increase in the supply of peanut hay for these States.

The trend of all tame-hay production in the Southern States has been definitely upward during the last 20 years (fig. 5), with the peanut enterprise contributing 8 or 9 percent of this total until 1942. Under the spur of wartime need the importance of peanut-vine hay has increased, and it represented 11, 16, and 14 percent, respectively, of the South's tame-hay supply during 1942, 1943, and 1944.

Some reduction in the acreage of peanuts can be expected after the war as our sources of cheap imported oils are restored. But it is likely that part of the wartime acreage of peanuts for nuts will be maintained, and with



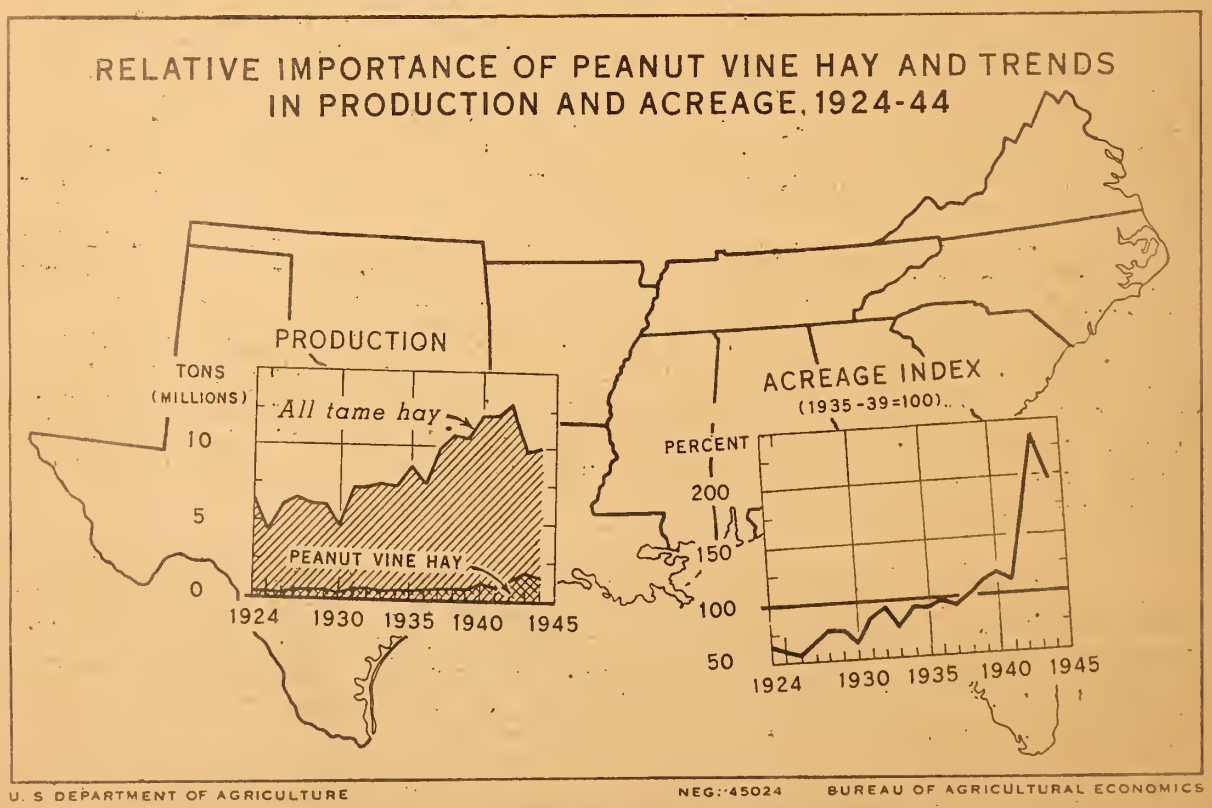


Figure 5.- Peanut-vine hay, a byproduct of the wartime need for oil crops, is contributing more importantly to the tame-hay supply of the South. The quality of this hay is directly proportional to the care exercised in preserving the leaves and removing excess dirt in the process of harvesting and curing.

more care in cleaning and curing, peanut-vine hay may be of somewhat greater importance than in pre-war years.

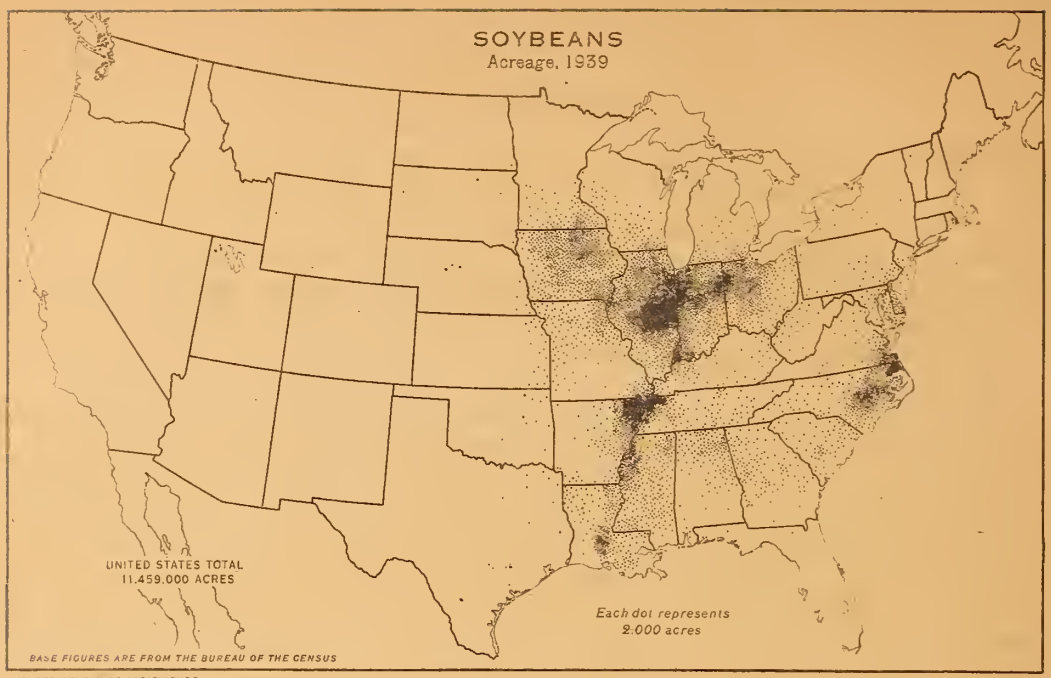
Soybean Hay

The soybean is noted for its varied uses in industry and as a food. Similarly, it has numerous uses on the farm. It may be harvested for beans or for hay, and it may be pastured or plowed under as a green manure crop. It grows on many kinds of soil and does well where soils are too acid to grow clovers or alfalfa. There is usually time to make soybean hay when some other crop fails, or soybeans may be planted following an early harvested crop, and then be turned under.

On a pre-war (1932-41) average of nearly 8 million acres, 37 percent of the crop was harvested for beans, 47 percent was cut for hay, and the remaining 16 percent was grazed or plowed under. Since Pearl Harbor, the soybean acreage has practically doubled, and our need for oil has been so great that the acreage harvested for hay has been held at 18 to 20 percent of the total acreage. New varieties of much higher oil content have also contributed to harvesting a higher proportion of the crop for beans. In the principal producing States, only a little of the current soybean acreage is intentionally planted for hay. Some of it represents acreage that failed to set beans, while some is incidental to harvesting with the cutting of borders or "hay roads" around fields to permit the use of a combine.

Unlike peanut-vine hay, very little of the soybean hay comes as a direct byproduct of the harvest operation. This is especially true in recent years with an increasing number of combines being used. Only the stems remain at this time and, where saved, they are used as straw. Soybean straw has a higher proportion of digestible protein and carbohydrates than oat or wheat straw and may be fed as roughage when supplemented with a small-grain ration. The soybean is not considered effective in erosion control. In fact, the soil of a soybean field, after harvest, is in a condition especially vulnerable to soil washing and, for this reason, the crop should not be grown on land that has any considerable degree of slope.

Although the soybean acreage has expanded greatly, its location is much the same as that shown for 1939 in figure 6. Soybeans and corn require about the same kind of growing conditions. During 1944 the Corn Belt States of Iowa, Illinois, Indiana, and Ohio included about 65 percent of the total soybean acreage grown for all purposes. The Delta States of Mississippi, Arkansas, and Louisiana accounted for close to an additional 9 percent. Soybean hay contributed but 4 percent of all tame hay in the northern group of soybean States during the period 1925-29. This increased to 12 percent during the next 10 years and has now fallen back to around 7 or 8 percent (fig. 6). In the southern group of soybean States, however, soybean hay has tended to contribute a rather constant 12 to 14 percent of the total tame-hay supply during the last 20 years, the increasing production of soybean hay paralleling the increase in that of all tame hay. A much sharper reduction in harvested acreage of soybean hay is indicated in the northern group of States where the diversion of acreage to oil uses has been most pronounced.



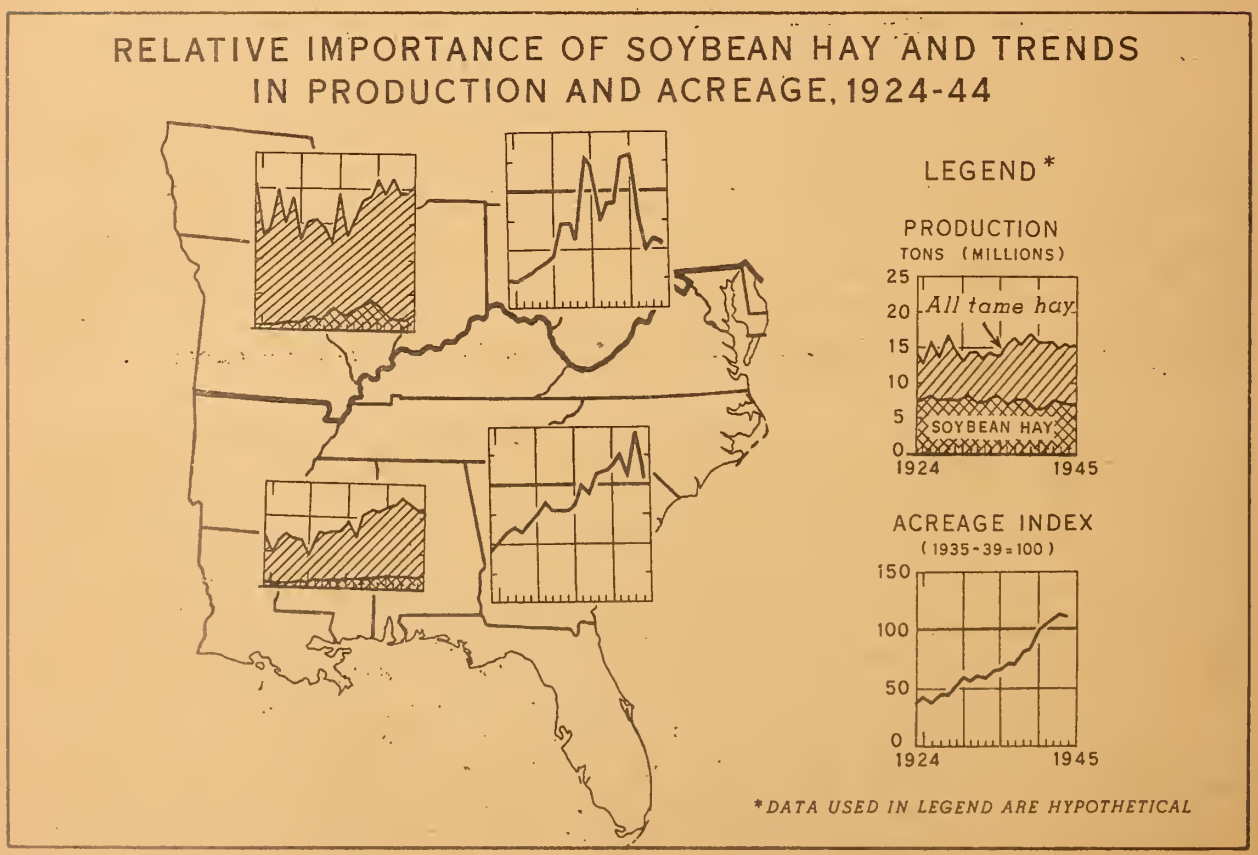


Figure 6.- The wartime acreage of soybean hay has been confined more and more to that resulting from crop failure and to the acreage harvested when hay roads are cut to permit use of the combine. Soybean hay is slow to cure, but it stands wet weather with relatively little loss.

Soybean hay is not so easily cured as other legume hays. The stems cure slowly, and care must be exercised to prevent heating in the stack or in the bale. On the other hand, soybean hay is not injured by wet weather so easily as are other legume hays, and the weathered hay is of good feeding value and is readily eaten by livestock. Experimental work is being carried on to develop varieties of soybeans that are adapted to the conditions that prevail farther north and west. With this extension of the soybean belt, an additional contribution will be made to the growing supply of high-quality legume hay in the United States.

Peacetime Implications of Wartime Changes

The factor of greatest significance that emerges from a detailed study of trends in hay production is the pronounced tendency toward displacement of lower-yielding, poorer-quality grass hays with more nutritious, higher-quality legumes. This trend, already in evidence in the thirties, has been accelerated during the present conflict and may be expected to continue in future years. World War II has, no doubt, slowed possible expansions in hay acreage; but this, in itself, has been a factor in intensifying hay production on the acreage available. Wartime pressures have caused serious disruptions in livestock production in regions that are dependent on interstate movement of feed supplies, and this emphasizes the need for and the economy of as much local forage production as possible.

It is reasonable to expect that fertilizers can be made available to farmers in peacetime in much greater quantities and at somewhat lower prices per pound of plant nutrients than before the war. Special effort should be made to develop and provide at reasonable prices adequate seed supplies of superior legume varieties as a basis for improved hays and pastures. The pressures for wartime production of foods for direct human consumption will be relaxed, and we shall be thinking of increasing the consumption of livestock and livestock products. This will be in line with good nutrition, and with the wishes and habits of our consuming public. The return of a substantial portion of our cropland to hay and pasture will likewise be in the interest of soil conservation and good land use -- restoring depleted fertility reserves and maintaining and increasing our soil resource for the use of future generations or for possible future emergencies.

These changes in the Nation's ways of farming will be in the direction of less intensive use of cropland in general, but of greater intensity in the production of hays and pastures than we have previously known. Perhaps some of our submarginal acres will revert to a grassland economy designed to prevent soil loss at small initial investment, but some of the more fertile acres that have been producing intertilled crops in wartime will be devoted to producing high-quality leguminous hay. It will be highly necessary that the resulting forage find its way into livestock production -- since there must be a market for the crop or farmers will not long continue to give it a place in their cropping systems.

Adapted legumes, grasses, and small grains are becoming available, and cultural methods are being made known that can permit a greatly expanded forage supply in most areas of the cotton South. Dried sweetpotatoes appear

to have possibilities as a source of cheap concentrates. There is urgent need for further progress in developing livestock of greater productivity for the warmer climates. Problems in the control of insect pests and internal parasites are nearing solution. These factors, together with the possibility of greater industrialization of the area and hence increased purchasing power for many of its consumers, may provide acceptable alternatives to a one-crop system of farming.

Similarly, the dairy areas of the Northeast can benefit from greater attention to increasing the productivity of their hay lands and pastures. Even in the arid plains the dependable supply of alfalfa and other forage produced on nearby irrigated lands provides a hay base that lends stability to the entire economy of the area -- range livestock, dry farming, and irrigated farming alike.

The possibility of further increasing the quality of hay through new methods of curing is now being investigated in several States. Duct systems through which air is blown are being installed in the hay mows of barns, permitting hay to be placed in the mow shortly after it is cut. The curing process is completed in the barn. Perhaps the greatest advantage of this method of barn-curing is the saving of nearly all the leaves, increasing materially the tonnage and quality of hay available for use. The method has considerable significance for hay producers in humid areas where hay quality is frequently depreciated by curing in the field in wet weather.

Studies indicate tentatively that the carotene content of barn-dried hay is double that of hay cured in the field; on the other hand, the sugar content is somewhat lower. Experimental work in barn-curing of hay is being conducted in at least 11 States, mostly in the humid parts of the country. Some of these studies go much farther than the mechanics of barn-curing, covering also economic and nutritional factors. Forage grasses and legumes are being preserved as silage under difficult hay-curing conditions, particularly in the Northeast.

Along with improvements in the quantity and quality of our hays is improvement in pastures and ranges, the other major sources of our total forage supply. Figures are not available to measure this improvement adequately, but considerable emphasis has been given to pasture improvement through Federal and State programs in recent years. Farmers have been encouraged to reseed with higher-yielding pasture grasses and legumes, to ridge pasture land for better distribution of water, to practice pasture rotation, to apply fertilizer and lime, and generally to manage their pastures in ways that will increase their carrying capacity. Special measures may be necessary to overcome shortages of native grass seed, which is a real impediment to range improvement.

Efforts must be focused on a better balanced forage supply that will be adequate at every season of the year in each local area. This means not only giving attention to the improvement of hay but exploring fully the possibilities in obtaining more feed from permanent, rotation, and temporary pastures, from grass and legume silage, and from crop aftermath. With vigorous attention to all these phases, the future forage supply of the Nation should be reflected in more and cheaper livestock products, better nutrition, sustained crop production and soil productivity, and a balanced agriculture.

APPENDIX TABLES

The appendix tables devoted to harvested acreage, production, and yield per acre of clover and timothy, alfalfa, cowpea, and soybean hay carry data summarized by groups of States as well as for the United States. In each instance, the States were studied individually, and those showing similar trends were grouped together for analysis. No effort has been made to maintain the same groupings from one hay crop to another, and each table indicates what States are included in the different groups. The group boundaries are also shown on the charts accompanying this report.

List of Tables

Table 1.- Harvested acreage and acreage index, principal tame hays, United States, 1925-44 (1935-39 = 100)

Year	Clover and timothy	Alfalfa	Lespedeza	Soybean	Cowpea	Peanut vine	All tame hay
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
Average:							
1925-29	30,319	11,008	315	1,509	1,261	1,099	55,653
1930-34	23,762	12,072	988	2,861	1,885	1,348	55,678
1935-39	19,389	13,560	3,293	3,789	2,006	1,630	55,770
1940-44	20,224	14,833	5,811	3,489	1,613	2,768	59,979
1925	31,677	10,388	253	1,175	966	982	55,444
1926	29,970	10,721	310	1,431	1,226	908	55,461
1927	31,563	11,277	338	1,556	1,747	1,116	57,604
1928	28,519	11,123	325	1,609	1,414	1,235	54,013
1929	29,867	11,529	349	1,774	953	1,252	55,741
1930	26,990	11,609	440	2,062	1,091	1,045	53,996
1931	24,978	11,740	584	2,772	1,571	1,415	56,103
1932	23,449	12,607	893	2,738	2,451	1,509	56,119
1933	23,249	12,713	1,171	2,506	1,991	1,242	55,810
1934	20,143	11,691	1,850	4,227	2,321	1,528	56,361
1935	19,746	13,560	2,715	4,044	1,975	1,510	55,614
1936	21,029	14,073	2,253	3,116	2,006	1,617	56,618
1937	18,105	13,547	3,099	3,469	2,239	1,502	53,943
1938	19,524	13,385	3,669	3,724	1,915	1,664	55,631
1939	18,543	13,234	4,731	4,590	1,896	1,859	57,046
1940	19,898	13,903	5,018	4,894	2,010	1,950	60,035
1941	19,324	14,963	5,428	3,677	1,956	1,822	59,317
1942	19,799	15,814	6,525	2,738	1,799	3,017	60,117
1943	20,722	15,003	6,099	3,387	1,374	3,848	60,880
1944	21,375	14,480	5,983	2,747	926	3,202	59,547
			Acreage index				
Average:							
1925-29	156	81	10	40	63	67	100
1930-34	123	89	30	76	94	83	100
1935-39	100	100	100	100	100	100	100
1940-44	104	109	176	92	80	170	108
1925	163	77	8	31	48	60	99
1926	155	79	9	38	61	56	99
1927	163	83	10	41	87	68	103
1928	147	82	10	42	70	76	97
1929	154	85	11	47	48	77	100
1930	139	86	13	54	54	64	97
1931	129	87	18	73	78	87	101
1932	121	93	27	72	122	93	101
1933	120	94	36	66	99	76	100
1934	104	86	56	112	116	94	101
1935	102	100	82	107	98	93	100
1936	108	104	68	82	100	99	102
1937	93	100	94	92	112	92	97
1938	101	99	111	98	95	102	100
1939	96	98	144	121	95	114	102
1940	103	103	152	129	100	120	108
1941	100	110	165	97	98	112	106
1942	102	117	198	72	90	185	108
1943	107	111	185	89	68	236	109
1944	110	107	182	72	46	196	107

Table 2.- Production and production index, principal tame hays, United States, 1925-44 (1935-39 = 100)

Year	Clover and timothy	Alfalfa	Lespedeza	Soybean	Cowpea	Peanut vine	All tame hay
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Average:							
1925-29	35,416	23,295	340	1,747	1,118	522	73,206
1930-34	24,244	22,636	979	3,264	1,552	607	64,888
1935-39	23,624	27,102	3,457	5,052	1,652	811	74,244
1940-44	27,405	32,638	5,868	4,461	1,314	1,402	86,219
1925	32,646	21,821	206	1,185	698	415	67,334
1926	31,166	21,529	334	1,687	1,162	445	67,142
1927	41,879	25,454	400	1,837	1,633	577	83,341
1928	33,251	23,882	380	1,974	1,290	598	72,196
1929	38,139	23,787	380	2,051	805	574	76,018
1930	27,187	22,713	331	1,938	764	456	63,705
1931	27,620	21,396	632	3,479	1,416	698	66,989
1932	25,831	25,924	923	3,433	2,059	692	71,768
1933	24,072	24,113	1,298	2,917	1,692	527	66,296
1934	16,512	19,036	1,709	4,545	1,830	660	55,683
1935	25,804	28,589	2,854	5,422	1,584	782	78,460
1936	20,588	24,763	1,800	3,002	1,438	755	62,718
1937	23,198	26,718	3,287	4,731	1,949	802	73,266
1938	26,278	28,548	4,293	5,335	1,670	869	80,399
1939	22,253	26,894	5,049	6,772	1,621	845	76,375
1940	26,757	30,119	5,058	6,560	1,711	1,092	85,067
1941	23,470	32,388	5,537	4,779	1,618	958	82,736
1942	28,661	36,478	7,426	3,689	1,500	1,483	92,204
1943	29,368	32,502	5,928	4,060	1,012	1,914	87,244
1944	28,771	31,702	5,390	3,217	728	1,563	83,845
			Production index				
Average:							
1925-29	150	86	10	35	68	64	99
1930-34	103	84	28	65	93	75	87
1935-39	100	100	100	100	100	100	100
1940-44	116	120	170	88	80	173	116
1925	138	80	6	24	42	51	91
1926	132	79	10	33	70	55	90
1927	177	94	12	36	99	71	112
1928	141	88	11	39	78	74	97
1929	161	88	11	41	49	71	102
1930	115	84	10	38	46	56	86
1931	117	79	18	69	86	86	90
1932	109	96	27	68	125	85	97
1933	102	89	38	58	102	65	89
1934	70	70	49	90	111	81	75
1935	109	106	83	107	96	96	106
1936	87	91	52	59	87	93	84
1937	98	99	95	94	118	99	99
1938	111	105	124	106	101	107	108
1939	94	99	146	134	98	104	103
1940	113	111	146	130	104	135	115
1941	99	120	160	95	98	118	111
1942	121	135	215	73	91	183	124
1943	124	120	172	80	61	236	118
1944	122	117	156	64	44	193	113

Table 3.- Yield per acre and yield index, principal tame hays, United States, 1925-44.

(1935-39 = 100)

Year	Clover and timothy	Alfalfa	Lespedeza	Soybean	Cowpea	Peanut vine	All tame hay
	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Average:							
1925-29	1.17	2.12	1.08	1.16	.89	.47	1.32
1930-34	1.02	1.88	.99	1.14	.82	.45	1.17
1935-39	1.22	2.00	1.05	1.33	.82	.50	1.33
1940-44	1.36	2.20	1.01	1.28	.81	.51	1.44
1925	1.03	2.10	.81	1.01	.72	.42	1.21
1926	1.04	2.01	1.08	1.18	.95	.49	1.21
1927	1.33	2.26	1.18	1.18	.93	.52	1.45
1928	1.17	2.15	1.17	1.23	.91	.48	1.34
1929	1.28	2.06	1.09	1.16	.84	.46	1.36
1930	1.01	1.96	.75	.94	.70	.44	1.18
1931	1.11	1.82	1.08	1.26	.90	.49	1.19
1932	1.10	2.06	1.03	1.25	.84	.46	1.28
1933	1.04	1.90	1.11	1.16	.85	.42	1.19
1934	.82	1.63	.92	1.08	.79	.43	.99
1935	1.31	2.11	1.05	1.34	.80	.52	1.41
1936	.98	1.76	.80	.96	.72	.47	1.11
1937	1.28	1.97	1.06	1.36	.87	.53	1.36
1938	1.35	2.13	1.17	1.43	.87	.52	1.45
1939	1.20	2.03	1.07	1.48	.85	.45	1.34
1940	1.34	2.17	1.01	1.34	.85	.56	1.42
1941	1.21	2.16	1.02	1.30	.83	.53	1.39
1942	1.45	2.31	1.14	1.35	.83	.49	1.53
1943	1.42	2.17	.97	1.20	.74	.50	1.43
1944	1.35	2.19	.90	1.17	.79	.49	1.41
			Yield Index				
Average:							
1925-29	96	106	103	87	108	94	99
1930-34	84	94	94	86	100	90	88
1935-39	100	100	100	100	100	100	100
1940-44	112	110	96	96	99	102	108
1925	84	105	77	76	88	84	91
1926	85	100	103	89	116	98	91
1927	109	113	112	89	113	104	109
1928	96	108	111	92	111	96	101
1929	105	103	104	87	102	92	102
1930	83	98	71	71	85	88	89
1931	91	91	103	95	110	98	89
1932	90	103	98	94	102	92	96
1933	85	95	106	87	104	84	89
1934	67	82	88	81	96	86	74
1935	107	106	100	101	98	104	106
1936	80	88	76	72	88	94	83
1937	105	98	101	102	106	106	102
1938	111	106	111	108	106	104	109
1939	98	102	102	111	104	90	101
1940	110	108	96	101	104	112	107
1941	99	108	97	98	101	106	105
1942	119	116	109	102	101	98	115
1943	116	108	92	90	90	100	108
1944	111	110	86	88	96	98	106

Table 4.- Index numbers of acreage, production and yield per acre of all tame hay and of alfalfa-lespedeza, United States, 1925-44 (1935-39 = 100)

Year	All tame hay			Alfalfa and lespedeza		
	Acreage	Production	Per acre yield	Acreage	Production	Per acre yield
Average:						
1925-29	100	99	99	67	77	115
1930-34	100	87	88	77	77	100
1935-39	100	100	100	100	100	100
1940-44	108	116	108	122	126	103
1925	99	91	91	63	72	114
1926	99	90	91	65	72	109
1927	103	112	109	69	85	123
1928	97	97	101	68	79	117
1929	100	102	102	70	79	112
1930	97	86	89	71	75	106
1931	101	90	89	73	72	99
1932	101	97	96	80	88	110
1933	100	89	89	82	83	101
1934	101	75	74	80	68	85
1935	100	106	106	97	103	107
1936	102	84	83	97	87	90
1937	97	99	102	99	98	99
1938	100	108	109	101	107	107
1939	102	103	101	107	105	98
1940	108	115	107	112	115	103
1941	106	111	105	121	124	103
1942	108	124	115	133	144	109
1943	109	118	108	125	126	101
1944 1/	107	113	106	121	121	100

1/ Based on unpublished data.

Table 5.- Harvested acreage, production and yield per acre of timothy and clover hay, for selected groups of States and for the United States, 1920-44

Year	Harvested acreage			Production			Yield per harvested acre		
	Group I 1/	Group II 2/	United States	Group I 1/	Group II 2/	United States	Group I 1/	Group II 2/	United States
	Million acres	Million acres	Million acres	Million tons	Million tons	Million tons	Tons	Tons	Tons
Average:									
1920-24	22.4	9.3	34.7	26.5	10.5	41.2	1.2	1.1	1.2
1925-29	19.5	8.5	30.3	22.0	10.4	35.4	1.1	1.2	1.2
1930-34	14.7	7.4	23.8	13.7	8.4	24.2	.9	1.1	1.0
1935-39	11.3	6.8	19.4	13.2	8.6	23.6	1.2	1.3	1.2
1940-44	12.9	6.1	20.2	17.1	8.4	27.4	1.3	1.4	1.4
1920	21.8	9.5	34.3	26.4	10.6	41.3	1.2	1.1	1.2
1921	22.1	9.3	34.4	23.7	8.4	36.1	1.1	.9	1.0
1922	24.0	9.3	36.5	30.3	11.6	46.3	1.3	1.2	1.3
1923	21.9	9.2	34.3	23.8	10.2	38.5	1.1	1.1	1.1
1924	22.1	9.2	34.0	28.4	11.7	43.6	1.3	1.3	1.3
1925	20.3	8.9	31.7	19.1	10.4	32.6	.9	1.2	1.0
1926	19.0	8.8	30.0	18.9	9.5	31.2	1.0	1.1	1.0
1927	20.5	8.7	31.6	26.9	11.7	41.9	1.3	1.3	1.3
1928	18.0	8.2	28.5	19.7	10.4	33.3	1.1	1.3	1.2
1929	19.7	7.9	29.9	25.2	10.0	38.1	1.3	1.3	1.3
1930	17.4	7.5	27.0	16.1	8.7	27.2	.9	1.2	1.0
1931	15.8	7.4	25.0	16.0	9.4	27.6	1.0	1.3	1.1
1932	14.4	7.3	23.4	15.1	8.3	25.8	1.0	1.1	1.1
1933	14.4	7.3	23.2	13.9	8.3	24.1	1.0	1.1	1.0
1934	11.3	7.6	20.1	7.3	7.5	16.5	.6	1.0	.8
1935	11.0	7.4	19.7	14.3	9.7	25.8	1.3	1.3	1.3
1936	12.7	7.1	21.0	11.6	7.4	20.6	.9	1.0	1.0
1937	10.0	6.9	18.1	12.1	9.4	23.2	1.2	1.4	1.3
1938	11.7	6.6	19.5	15.2	9.2	26.3	1.3	1.4	1.4
1939	11.1	6.2	18.5	13.1	7.5	22.3	1.2	1.2	1.2
1940	12.8	6.0	19.9	16.5	8.5	26.8	1.3	1.4	1.3
1941	12.1	6.0	19.3	14.8	6.7	23.5	1.2	1.1	1.2
1942	12.5	6.0	19.8	17.8	8.8	28.7	1.4	1.5	1.4
1943	13.2	6.2	20.7	17.9	9.5	29.4	1.4	1.5	1.4
1944	13.8	6.2	21.4	18.4	8.4	28.8	1.3	1.4	1.4

1/ Group I includes Minn., Iowa, Mo., Wis., Ill., Mich., Ind., Ohio, W. Va., Va., Ky., and Md.

2/ Group II includes Me., N. H., Vt., Mass., Conn., R. I., N. Y., Pa., N. J., and Del.

Table 6.- Indexes of harvested acreage, production and yield per acre of timothy and clover hay, for selected groups of States and for the United States, 1920-44 (1935-39 = 100)

Year	Harvested acreage			Production			Yield per harvested acre		
	Group I 1/	Group II 2/	United States	Group I 1/	Group II 2/	United States	Group I 1/	Group II 2/	United States
Average:									
1920-24	198	136	179	200	122	174	102	90	98
1925-29	172	124	156	166	121	150	97	98	96
1930-34	130	108	123	104	98	103	80	90	84
1935-39	100	100	100	100	100	100	100	100	100
1940-44	114	89	104	129	97	116	114	110	112
1920	192	139	177	200	123	175	104	89	98
1921	195	137	178	179	97	153	92	71	86
1922	212	136	188	229	135	196	108	99	104
1923	193	135	177	180	118	163	93	88	92
1924	195	135	176	214	135	184	110	101	105
1925	179	130	163	144	121	138	80	93	84
1926	168	128	155	143	110	132	86	86	85
1927	181	128	163	203	135	177	112	106	109
1928	159	120	147	149	121	141	93	101	96
1929	174	116	154	190	116	161	109	101	105
1930	154	110	139	122	100	115	79	92	83
1931	140	108	129	121	109	117	86	102	91
1932	127	107	121	114	96	109	90	90	90
1933	127	107	120	105	96	102	83	90	85
1934	100	111	104	55	87	70	56	79	67
1935	97	108	102	108	112	109	111	104	107
1936	112	104	108	87	86	87	78	82	80
1937	88	101	93	91	109	98	103	108	105
1938	104	96	101	115	106	111	111	111	111
1939	98	90	96	99	86	94	101	96	98
1940	113	88	103	124	99	113	110	114	110
1941	107	87	100	112	78	99	104	89	99
1942	110	88	102	135	102	121	122	116	119
1943	116	91	107	135	110	124	116	121	116
1944	122	91	110	139	97	122	114	108	111

1/ Group I includes Minn., Iowa, Mo., Wis., Ill., Mich., Ind., Ohio, W. Va., Va., Ky. and Md.

2/ Group II includes Me., N. H., Vt., Mass., Conn., R. I., N. Y., Pa., N. J., and Del.

Table 7.- Harvested acreage, production and yield per acre, alfalfa hay, selected groups of States, United States, 1920-44

Year	Harvested acreage						Production						Yield per harvested acre					
	Group I 1/	Group II 2/	Group III 3/	Group IV 4/	Group V 5/	U. S.	Group I 1/	Group II 2/	Group III 3/	Group IV 4/	Group V 5/	U. S.	Group I 1/	Group II 2/	Group III 3/	Group IV 4/	Group V 5/	U. S.
	Mil. acres	Mil. acres	Mil. acres	Mil. acres	Mil. acres	Mil. acres	Mil. tons	Mil. tons	Mil. tons	Mil. tons	Mil. tons	Mil. tons	Tons	Tons	Tons	Tons	Tons	Tons
Average:																		
1920-24	2.7	5.0	.5	.7	.3	9.5	7.7	9.2	.9	1.7	.5	20.6	2.8	1.8	2.0	2.3	2.0	2.2
1925-29	2.9	5.2	1.3	1.0	.4	11.0	8.3	9.0	2.5	2.2	.7	23.3	2.9	1.7	2.0	2.1	2.0	2.1
1930-34	2.9	4.7	2.0	1.6	.5	12.1	8.0	6.9	3.0	3.0	1.0	22.6	2.7	1.5	1.5	1.9	1.9	1.9
1935-39	2.9	3.7	3.3	2.4	.7	13.6	8.4	5.5	6.1	4.7	1.3	27.1	2.9	1.5	1.8	2.0	1.9	2.0
1940-44	3.2	3.6	3.6	2.7	.9	14.8	9.2	6.9	7.1	6.1	1.7	32.6	2.9	1.9	1.9	2.2	1.9	2.2
1920	2.6	5.1	.3	.6	.2	9.0	7.4	10.2	.5	1.4	.4	20.5	2.8	2.0	2.1	2.2	2.1	2.3
1921	2.7	5.0	.3	.7	.2	9.2	7.9	9.0	.7	1.5	.5	20.1	2.9	1.8	2.0	2.2	2.0	2.2
1922	2.7	4.9	.4	.7	.3	9.3	7.8	8.8	.8	1.6	.6	20.1	2.9	1.8	2.0	2.2	2.2	2.2
1923	2.9	5.0	.5	.8	.3	9.8	8.2	9.5	1.0	1.9	.5	21.6	2.9	1.9	1.8	2.4	1.9	2.2
1924	2.8	5.2	.8	.9	.3	10.4	7.0	8.8	1.8	2.1	.7	20.8	2.5	1.7	2.2	2.3	2.0	2.0
1925	2.8	5.1	1.0	.9	.3	10.4	8.3	8.5	1.9	2.0	.7	21.8	3.0	1.7	2.0	2.1	2.1	2.1
1926	2.9	5.1	1.1	1.0	.4	10.7	8.1	8.0	2.1	2.1	.7	21.5	2.8	1.6	1.8	2.0	2.0	2.0
1927	2.9	5.4	1.3	1.0	.4	11.3	8.5	10.6	2.8	2.2	.8	25.5	3.0	2.0	2.2	2.1	2.1	2.3
1928	3.0	5.1	1.3	1.0	.4	11.1	8.6	9.1	2.7	2.1	.8	23.9	2.9	1.8	2.0	2.1	2.1	2.2
1929	3.0	5.2	1.5	1.2	.4	11.5	8.1	8.8	3.0	2.6	.7	23.8	2.7	1.7	2.0	2.2	1.9	2.1
1930	3.0	5.1	1.6	1.2	.4	11.6	8.6	8.2	2.7	2.2	.7	22.7	2.8	1.6	1.6	1.9	1.8	2.0
1931	3.0	4.7	1.8	1.4	.5	11.7	7.7	6.4	2.8	2.7	1.1	21.4	2.6	1.4	1.5	2.0	2.2	1.8
1932	3.0	5.0	2.0	1.6	.5	12.6	8.7	8.3	3.6	3.5	1.0	25.9	2.9	1.6	1.8	2.2	1.9	2.1
1933	2.9	4.7	2.3	1.8	.6	12.7	7.9	7.0	3.7	3.4	1.2	24.1	2.7	1.5	1.6	2.0	2.0	1.9
1934	2.7	3.7	2.2	2.0	.6	11.7	7.1	4.5	2.3	3.3	1.1	19.0	2.7	1.2	1.1	1.6	1.8	1.6
1935	2.8	4.5	2.8	2.5	.6	13.6	7.9	7.3	5.9	5.4	1.2	28.6	2.8	1.6	2.1	2.2	2.1	2.1
1936	2.9	4.2	3.3	2.6	.7	14.1	8.5	5.2	5.1	4.1	1.1	24.8	3.0	1.3	1.5	1.6	1.7	1.8
1937	2.9	3.6	3.4	2.4	.7	13.5	8.5	5.0	6.0	4.5	1.6	26.7	2.9	1.4	1.8	1.9	2.1	2.0
1938	3.0	3.2	3.6	2.2	.7	13.4	8.6	5.3	7.1	4.8	1.5	28.5	2.9	1.6	2.0	2.2	2.0	2.1
1939	3.1	2.9	3.6	2.3	.7	13.2	8.6	4.5	6.1	4.9	1.3	26.9	2.8	1.6	1.7	2.1	1.8	2.0
1940	3.1	3.1	3.7	2.5	.8	13.9	9.0	5.2	7.3	5.5	1.6	30.1	2.9	1.7	2.0	2.2	2.0	2.2
1941	3.1	3.5	3.9	2.9	.9	15.0	9.0	6.6	7.3	6.4	1.6	32.4	2.9	1.9	1.9	2.2	1.8	2.2
1942	3.1	3.9	3.9	3.1	1.0	15.8	9.0	7.8	8.3	7.6	2.0	36.5	2.9	2.0	2.1	2.4	2.1	2.3
1943	3.1	3.9	3.6	2.7	.9	15.0	9.4	7.0	7.1	5.7	1.8	32.5	3.0	1.8	2.0	2.1	1.9	2.2
1944	3.3	3.9	3.1	2.5	.9	14.5	9.7	7.9	5.5	5.3	1.7	31.7	2.9	2.0	1.8	2.1	1.9	2.2

1/ Group I includes Idaho, N. Mex., Ariz., Utah, Nev., Wash., Oreg., Calif. 2/ Group II includes Mont., Wyo., Colo., N. Dak., S. Dak., Nebr., Kans., Okla. 3/ Group III includes Mich., Wis., Minn. 4/ Group IV includes Ohio, Ind., Ill., Iowa, Mo. 5/ Group V includes Me., N. H., Vt., Mass., R. I., Conn., N. Y., N. J., Pa., Del., Md.

Table 8.- Indexes of harvested acreage, production and yield per acre of alfalfa hay, for selected groups of States and for the United States, 1920-44 (1935-39 = 100)

Year	Harvested acreage						Production						Yield per harvested acre					
	Group I 1/	Group II 2/	Group III 3/	Group IV 4/	Group V 5/	U. S.	Group I 1/	Group II 2/	Group III 3/	Group IV 4/	Group V 5/	U. S.	Group I 1/	Group II 2/	Group III 3/	Group IV 4/	Group V 5/	U. S.
Average:																		
1920-24	94	137	14	31	38	70	91	169	16	36	40	76	97	124	113	115	104	108
1925-29	99	140	38	43	52	81	99	165	42	46	54	86	100	117	110	106	104	106
1930-34	100	126	59	66	75	89	95	126	50	64	75	84	95	99	84	96	100	94
1935-39	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1940-44	108	99	109	115	129	109	110	127	117	128	130	120	101	128	107	112	100	110
1920	89	138	8	26	30	66	88	186	9	29	32	76	99	134	117	114	107	114
1921	92	135	10	27	34	68	94	165	11	31	35	74	102	122	112	113	104	110
1922	94	133	11	30	38	68	93	160	13	34	42	74	99	121	112	113	111	108
1923	98	136	16	34	42	72	97	173	16	41	40	80	99	128	102	119	97	111
1924	96	141	24	39	48	76	84	161	29	45	49	77	87	113	121	115	102	100
1925	96	139	28	40	49	77	99	155	32	41	52	80	103	112	113	104	107	105
1926	98	138	34	43	50	79	96	147	34	44	51	79	97	107	102	101	100	100
1927	99	146	40	44	53	83	101	194	47	47	57	94	102	132	119	108	107	113
1928	102	140	40	42	53	82	102	167	45	44	56	88	100	120	110	106	107	108
1929	102	140	46	48	54	85	96	161	50	54	52	88	94	114	108	112	98	103
1930	104	138	49	49	56	86	102	150	44	46	52	84	98	108	91	94	93	98
1931	101	128	54	57	70	87	91	117	46	56	78	79	90	91	84	99	112	91
1932	104	137	60	66	78	93	104	152	59	74	76	96	100	111	99	112	98	103
1933	100	128	68	74	85	94	94	129	62	72	88	89	94	100	91	98	103	95
1934	91	102	66	85	85	86	84	82	39	69	81	70	93	80	59	80	95	82
1935	95	122	84	103	85	100	93	133	98	113	92	106	98	109	117	110	108	106
1936	98	113	100	108	96	104	101	96	84	87	82	91	103	85	85	80	86	88
1937	100	99	101	99	106	100	101	92	99	96	115	99	101	93	99	96	108	98
1938	102	87	109	94	106	99	102	96	117	102	112	105	100	111	108	109	105	106
1939	105	80	107	96	106	98	102	83	101	102	98	99	98	104	94	107	92	102
1940	107	83	111	105	117	102	108	95	120	116	122	111	101	114	108	111	104	108
1941	106	94	116	122	126	110	107	122	120	135	118	120	100	128	104	111	93	108
1942	107	106	118	131	140	117	107	143	137	161	151	135	100	135	116	123	107	116
1943	108	106	108	112	131	111	111	130	117	120	130	120	104	123	112	107	99	108
1944	113	106	92	103	132	107	115	145	90	111	126	117	102	136	98	108	96	110

1/ Group I includes Idaho, N. Mex., Ariz., Utah, Nev., Wash., Oreg., Calif. 2/ Group II includes Mont., Wyo., Colo., N. Dak., S. Dak., Nebr., Kans., Okla. 3/ Group III includes Mich., Wis., Minn. 4/ Group IV includes Ohio, Ill., Ind., Iowa, Mo. 5/ Group V includes Me., N. H., Vt., Mass., R. I., Conn., N. Y., N. J., Pa., Del., Md.

Table 9.- Harvested acreage, production and yield per acre of lespedeza hay, and indexes of acreage, production and yield, United States, 1924-44
(1935-39 = 100)

Year	Harvested acreage		Production		Yield per harvested acre	
	1,000 acres	Index	1,000 tons	Index	Tons	Index
Average:						
1925-29	315	10	340	10	1.1	103
1930-34	988	30	979	28	1.0	94
1935-39	3,293	100	3,457	100	1.0	100
1940-44	5,811	176	5,868	170	1.0	96
1924	327	10	285	8	.9	83
1925	253	8	206	6	.8	77
1926	310	9	334	10	1.1	103
1927	338	10	400	12	1.2	112
1928	325	10	380	11	1.2	111
1929	349	11	380	11	1.1	104
1930	440	13	331	10	.8	71
1931	584	18	632	18	1.1	103
1932	893	27	923	27	1.0	98
1933	1,171	36	1,298	38	1.1	106
1934	1,850	56	1,709	49	.9	88
1935	2,715	82	2,854	83	1.0	100
1936	2,253	68	1,800	52	.8	76
1937	3,099	94	3,287	95	1.1	101
1938	3,669	111	4,293	124	1.2	111
1939	4,731	144	5,049	146	1.1	102
1940	5,018	152	5,058	146	1.0	96
1941	5,428	165	5,537	160	1.0	97
1942	6,525	198	7,426	215	1.1	109
1943	6,099	185	5,928	172	1.0	92
1944	5,983	182	5,390	156	.9	86

Table 10.- Harvested acreage, production and yield per acre of cowpea hay, for selected groups of States and for the United States, 1924-44

Year	Harvested acreage		Production		Yield per harvested acre	
	Group 1/	United States	Group 1/	United States	Group 1/	United States
	Million acres	Million acres	Million tons	Million tons	Tons	Tons
Average:						
1925-29	.9	1.3	.7	1.1	.8	.9
1930-34	1.5	1.9	1.1	1.6	.8	.8
1935-39	1.7	2.0	1.4	1.7	.8	.8
1940-44	1.4	1.6	1.1	1.3	.8	.8
1924	1.0	1.4	.6	1.1	.7	.8
1925	.7	1.0	.4	.7	.6	.7
1926	.8	1.2	.7	1.2	.9	1.0
1927	1.2	1.7	1.0	1.6	.8	.9
1928	1.0	1.4	.8	1.3	.8	.9
1929	.7	1.0	.6	.8	.8	.8
1930	.8	1.1	.6	.8	.7	.7
1931	1.2	1.6	1.0	1.4	.8	.9
1932	1.9	2.5	1.5	2.1	.8	.8
1933	1.5	2.0	1.2	1.7	.8	.8
1934	1.8	2.3	1.3	1.8	.7	.8
1935	1.6	2.0	1.2	1.6	.8	.8
1936	1.7	2.0	1.2	1.4	.7	.7
1937	2.0	2.2	1.6	1.9	.8	.9
1938	1.7	1.9	1.4	1.7	.8	.9
1939	1.7	1.9	1.3	1.6	.8	.8
1940	1.7	2.0	1.3	1.7	.8	.8
1941	1.7	2.0	1.3	1.6	.8	.8
1942	1.6	1.8	1.2	1.5	.8	.8
1943	1.2	1.4	.8	1.0	.7	.7
1944	.8	.9	.6	.7	.8	.8

1/ Group includes N. C., S. C., Ga., Fla., Tenn., Ala., Miss., Ark., La., Okla., and Tex.

Table 11.- Indexes of harvested acreage, production and yield per acre of cowpea hay, for selected groups of States and for the United States, 1924-44
(1935-39 = 100)

Year	Harvested acreage		Production		Yield per harvested acre	
	Group 1/	United States	Group 1/	United States	Group 1/	United States
Average:						
1920-24						
1925-29	51	63	52	68	101	108
1930-34	85	94	83	93	98	100
1935-39	100	100	100	100	100	100
1940-44	80	80	79	80	98	99
1920						
1921						
1922						
1923						
1924	55	72	47	67	86	94
1925	38	48	28	42	73	88
1926	46	61	51	70	110	116
1927	70	87	75	99	108	113
1928	57	70	61	78	108	111
1929	43	48	43	49	100	102
1930	48	54	43	46	89	85
1931	72	78	76	86	105	110
1932	112	122	111	125	100	102
1933	89	99	90	102	101	104
1934	103	116	96	111	92	96
1935	92	98	88	96	95	98
1936	101	100	91	87	90	88
1937	114	112	120	118	105	106
1938	98	96	102	101	105	106
1939	96	94	98	98	102	104
1940	96	100	98	104	101	104
1941	96	98	98	98	101	101
1942	92	90	92	91	99	101
1943	70	68	62	61	87	90
1944	47	46	46	44	96	96

1/ Group includes N. C., S. C., Ga., Fla., Tenn., Ala., Miss., Ark., La., Okla., and Tex.

Table 12.- Harvested acreage, production and yield per acre of peanut vine hay and indexes of acreage, production and yield, United States, 1924-44
(1935-39 = 100)

Year	Harvested acreage		Production		Yield per harvested acre	
	1,000 acres	Index	1,000 tons	Index	Tons	Index
Average:						
1925-29	1,099	67	522	64	.47	94
1930-34	1,348	83	607	75	.45	90
1935-39	1,630	100	811	100	.50	100
1940-44	2,768	170	1,402	173	.51	102
1924	1,056	65	458	56	.43	86
1925	982	60	415	51	.42	84
1926	908	56	445	55	.49	98
1927	1,116	68	577	71	.52	104
1928	1,235	76	598	74	.48	96
1929	1,252	77	574	71	.46	92
1930	1,045	64	456	56	.44	88
1931	1,415	87	698	86	.49	98
1932	1,509	93	692	85	.46	92
1933	1,242	76	527	65	.42	84
1934	1,528	94	660	81	.43	86
1935	1,510	93	782	96	.52	104
1936	1,617	99	755	93	.47	94
1937	1,502	92	802	99	.53	106
1938	1,664	102	869	107	.52	104
1939	1,859	114	845	104	.45	90
1940	1,950	120	1,092	135	.56	112
1941	1,822	112	958	118	.53	106
1942	3,017	185	1,483	183	.49	98
1943	3,848	236	1,914	236	.50	100
1944	3,202	196	1,563	193	.49	98

Table 13 - Harvested acreage, production and yield per acre of soybean hay, for selected groups of States and for the United States, 1924-44

Year	Harvested acreage			Production			Yield per harvested acre		
	Group I 1/	Group II 2/	United States	Group I 1/	Group II 2/	United States	Group I 1/	Group II 2/	United States
	Million acres	Million acres	Million acres	Million tons	Million tons	Million tons	Tons	Tons	Tons
Average:									
1920-24									
1925-29	.7	.8	1.5	.8	.8	1.7	1.3	1.0	1.2
1930-34	1.6	1.0	2.9	2.0	1.0	3.3	1.2	1.0	1.1
1935-39	2.1	1.3	3.8	3.1	1.4	5.1	1.4	1.1	1.3
1940-44	1.6	1.6	3.5	2.2	1.7	4.5	1.4	1.1	1.3
1920									
1921									
1922									
1923									
1924	.5	.6	1.1	.7	.6	1.3	1.3	1.0	1.1
1925	.5	.7	1.2	.6	.5	1.2	1.2	.8	1.0
1926	.6	.8	1.4	.7	.9	1.7	1.2	1.1	1.2
1927	.7	.9	1.6	.8	.9	1.8	1.3	1.1	1.2
1928	.8	.8	1.6	1.0	.9	2.0	1.3	1.1	1.2
1929	.8	.9	1.8	1.0	1.0	2.1	1.2	1.1	1.2
1930	1.0	1.0	2.1	1.1	.8	1.9	1.0	.8	.9
1931	1.5	1.1	2.8	2.1	1.3	3.5	1.4	1.1	1.3
1932	1.6	1.0	2.7	2.2	1.0	3.4	1.4	1.0	1.2
1933	1.3	1.0	2.5	1.5	1.1	2.9	1.2	1.1	1.2
1934	2.8	1.0	4.2	3.0	1.0	4.5	1.1	1.0	1.1
1935	2.6	1.1	4.0	3.7	1.1	5.4	1.4	1.0	1.3
1936	1.6	1.3	3.1	1.5	1.2	3.0	1.0	1.0	1.0
1937	2.0	1.2	3.5	2.9	1.4	4.7	1.5	1.1	1.4
1938	2.0	1.4	3.7	3.1	1.7	5.3	1.6	1.2	1.4
1939	2.7	1.5	4.6	4.4	1.7	6.8	1.6	1.1	1.5
1940	2.8	1.5	4.9	3.8	1.8	6.6	1.4	1.2	1.3
1941	1.6	1.6	3.7	2.2	1.9	4.8	1.3	1.2	1.3
1942	1.1	1.4	2.7	1.6	1.7	3.7	1.5	1.2	1.4
1943	1.3	1.9	3.4	1.8	1.9	4.1	1.4	1.0	1.2
1944	1.1	1.4	2.7	1.4	1.5	3.2	1.2	1.1	1.2

1/ Group I includes Ohio, Ind., Ill., Iowa, Mo., W. Va.

2/ Group II includes Md., Del., Ky., Va., Tenn., N. C., S. C., Ga., Fla., Miss., Ala., La., Ark.

Table 14. - Indexes of harvested acreage, production and yield per acre of soybean hay, for selected groups of States and for the United States, 1924-44 (1935-39 = 100)

	Harvested acreage			Production			Yield per harvested acre		
	Group I 1/	Group II 2/	United States	Group I 1/	Group II 2/	United States	Group I 1/	Group II 2/	United States
Average:									
1920-24									
1925-29	31	61	40	27	59	35	89	96	87
1930-34	76	79	76	63	74	65	85	94	86
1935-39	100	100	100	100	100	100	100	100	100
1940-44	73	120	92	69	123	88	96	103	96
1920									
1921									
1922									
1923									
1924	24	44	30	21	39	26	89	90	85
1925	22	51	31	18	38	24	87	75	76
1926	27	61	38	24	63	33	88	103	89
1927	31	66	41	27	67	36	89	101	89
1928	36	60	42	33	61	39	93	103	92
1929	38	69	47	33	68	41	87	99	87
1930	47	76	54	34	57	38	74	75	71
1931	72	86	73	67	89	69	95	103	95
1932	73	78	72	71	71	68	100	91	94
1933	59	78	66	48	79	58	82	102	87
1934	128	78	112	89	73	90	76	94	81
1935	120	84	107	19	81	107	101	95	101
1936	73	100	82	48	88	59	67	88	72
1937	91	92	92	94	96	94	106	105	102
1938	91	111	98	99	118	106	111	106	108
1939	129	113	121	140	118	134	116	105	111
1940	131	117	129	122	124	130	96	106	101
1941	75	126	97	70	135	95	94	107	98
1942	50	109	72	52	119	73	106	109	102
1943	60	144	89	58	136	80	99	95	90
1944	52	106	72	44	103	64	88	97	88

1/ Group I includes Ohio, Ind., Ill., Iowa, Mo., W. Va.

2/ Group II includes Md., Del., Ky., Va., Tenn., N. C., S. C., Ga., Fla., Miss., Ala., La., and Ark.

Table 15.- Acreage, production, and yield of tame hay and all hay, and nutrient content of all hay, United States, 1920-44

Period	Acreage		Production		Yield per acre	
	Tame hay	All hay	Tame hay	All hay	Tame hay	All hay
	1,000 acres	1,000 acres	1,000 tons	1,000 tons	Tons	Tons
1920-24	58,101	73,907	76,442	90,503	1.32	1.22
1925-29	55,653	69,550	73,206	85,077	1.32	1.22
1930-34	55,678	68,069	64,888	73,801	1.17	1.08
1935-39	55,770	67,922	74,244	84,247	1.33	1.24
1940-44	59,979	72,950	86,219	96,430	1.44	1.32

Nutritive content of all hay, United States, 1920-44 1/

Period	T.D.N. in all hay			Digestible protein in all hay		
	Total	Per acre	Per ton	Total	Per acre	Per ton
	1,000 tons	Pounds	Pounds	1,000 tons	Pounds	Pounds
1920-24	44,150	1,195	976	5,118	138	113
1925-29	41,588	1,196	978	5,255	151	124
1930-34	36,217	1,064	981	4,944	145	134
1935-39	41,536	1,223	986	5,925	174	141
1940-44	47,678	1,307	989	6,853	188	142

1/ Assuming the following percentages of T.D.N. and digestible protein in each reported hay:-

	Clover-timothy	Alfalfa	Lespedeza	Soybean	Cowpea	Peanut vine	Sweet clover	Grains cut green	Misc. tame	Wild
T.D.N.	48.0	50.3	52.2	50.6	49.4	57.8	51.0	46.3	50.0	48.0
Digestible protein	4.4	10.6	9.2	11.1	12.6	6.3	12.0	4.5	5.0	2.0

(These percentages are from Henry and Morrison -- "Feeds and Feeding"; the figures for wild hay are their analyses of "prairie hay".)